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REPORT

ON

SMALL-POX IN CALCUTTA,

1833-34—1837-38—1843-44,

AND

Vaccination in Bengal,

FROM

1827 to 1844,

BY

DUNCAN STEWART, M. D.,

SURGEON, E. I. CO.'S SERVICE,

Superintendent General of Vaccination,

&c. &c. &c.

Published by Order of Government.

CALCUTTA:

G. H. HUTTMANN, MILITARY ORPHAN PRESS.

1844.

600
5/-

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Plan of CALCUTTA

Shewing the *POLICE DIVISIONS* and the Number of *THANNAHS* in each.

1844.

Reference

The figures on the Plan denote the Numbers of the Thannahs

- *First Division*
- *Second do:*
- *Third do:*
- *Fourth do:*

Division First.

No.	Name
1	Shaum Bazar
2	Baug Bazar
3	Shampooker
4	Churrukdangah.
5	Jorasanko
6	Simlah
7	Sukea's Street
27	Coomartolly
28	Hautkhollah
29	Jora Baug
30	Cubberdangah
31	Sustertollah

Division Second.

No.	Name
8	Puttledangah.
9	Thuntuneah.
10	Matchoo Bazar.
11	Colootollah.
12	Chunamgolly.
13	Mirzapoor.
14	Moocheeparah.
15	Lall Bazar.
32	Burroo Bazar.
34	Amratollah.
35	Clive Street.
36	Lall Diggee

Division Third.

No.	Name.
16	Shibtollah.
17	Goorealtollah.
18	Puddopooker.
19	Chandney Choke.
38	Larkans Tanah.
39	Chaundpal.

Division Fourth.

No.	Name.
20	Lalltollah.
21	Jaun Bazar.
23	Colingah.
24	Chouringhee.
25	Short's Bazar.
26	Bamun Busty.

T. Black, Asiatic Lith. Press. Calcutta

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TO LIEUT. GENERAL

THE RIGHT HONORABLE SIR HENRY HARDINGE, G. C. B.,

&c. &c. &c.

Governor General of India,

THE FOLLOWING PAGES ARE MOST RESPECTFULLY

DEDICATED.

"Vaccination we may confidently affirm can be maintained only by having Small-Pox constantly before our eyes, and nothing warrants us in the expectation of banishing the Bane by even the most liberal application of the Antidote."

(Dr. George Gregory.)

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REPORT

ON

Small-Pox and Vaccination

IN CALCUTTA,

FROM 1827 TO 1844.

THE objects which are proposed in the following pages are—

1st. To record with brevity and accuracy all the information of a practical or useful sort, which the writer has been able to collect relative to Small Pox in Calcutta, particularly as it appeared as an Epidemic in 1833, 1837 and 1844.

2dly. To state the results of his enquiries regarding a coincident epizootic malady, which prevailed lately among horned cattle and other animals.

3dly. To give some account of the present state of Vaccination in Calcutta, with notices of its progress and prospects generally in India.

If not the most fatal, assuredly cutaneous diseases are the most common among the Native population, the most troublesome, and the least understood in

Bengal. It is strange that they have attracted so little of the attention of Indian Medical writers. The oversight has been doubtless owing in some degree to the partial intercourse which English Physicians have with the lower orders of the people. With few exceptions the professional duties and avocations of Medical Officers in India bring them into acquaintance only with the Native sick in Regimental, or in Gaol Hospitals. In Calcutta, a few practitioners have access to the houses and families of some of the upper classes of the wealthy Hindoos, and a smaller number still in charge of Dispensaries have opportunities of becoming familiar with the prevalent diseases of the *poor*. But these Charities afford even to the most zealous and assiduous lover of his profession a very partial idea of the acute diseases of the country; for except in cases of accident or of Cholera, no in-door patients are received into these Institutions; and of the hundreds who apply for advice and medicine daily, *all* are too poor to afford the hire of conveyance thither often or regularly; besides, in dangerous illnesses, few of course could bear this.

Hence also in a great measure it happens, that among many thousand patients who have applied for and received advice and medicine at the various Calcutta Dispensaries, since 1st of January to 1st of June, not *one single case of Small Pox* has been seen, while the streets have been crowded every day with funeral processions, and the smoke of funeral piles on the banks of the River has tainted the morning gale for months past.

The Public Dispensaries, however, furnish many instances of the horrible sequelæ of Small Pox, numbers

of cases of scrofulous disease of joints, deep abscesses in the limbs, ulcerated cornea, and putrid sore throat, have presented themselves daily, the patients being covered with the marks of recent confluent Small Pox, their frames attenuated to the last degree, and sinking under hectic and diarrhœa.

Out of about 280 patients who, at the present time, apply for medicine daily at the Park Street Dispensary, 12 may be said on a daily average to be suffering from the secondary effects of Small Pox; they are mostly children, carried thither often from a distance, in the arms of a parent prepared to make any sacrifice for this her last surviving child save that of separation, in the hope of its recovery. Of these cases probably not 3 are able to attend regularly for any time, the rest are gradually lost sight of, and their fate is merely conjectural.

The late Epidemic shewed itself first with severity in November 1843, in which month 14 deaths were reported from the Hindoo ghat registries;—in December there occurred 58 deaths, in January 157, in February 455; in March the Native mortality had reached 963, several deaths had occurred among the European community, and a general panic arose.

Early in March the attention of the Chief Magistrate of Calcutta having been drawn to the alarming prevalence and increasing spread of Small Pox, and the inefficient means provided for its control amongst the Native population, and for the relief of the victims to its appalling malignancy, he addressed the following letter to the Secretary to Government.

From the Chief Magistrate of Calcutta,

To F. J. Halliday, Esq.,
Secy. to Govt. of Bengal,

Dated 7th March, 1844.

Sir,

I have the honor to submit, for the information of the Hon'ble the Deputy Governor of Bengal, the annexed statement prepared from the Records of the Office of the Superintendent of Police, shewing the number of deaths reported to have occurred by the Small Pox among the Native population of the town, in each month, during the years 1840, 1841, 1842, 1843, and in the current year up to the 6th instant.

2d. From this statement His Honor will perceive that, the mortality during 1843 has been 1.03 per cent. more than the greatest number of deaths in the three preceding years, while those of a single month in the present year, are short of the deaths that occurred during the whole of last year, by eight only.

3d. This fearful increase has caused a panic among the Native population, and has likewise in some measure been felt by the European community; owing to the infectious character of the disease, the Officers in charge of the several Public Hospitals, and their dependant Dispensaries refuse to admit this description of patients, and the Police Hospital has no suitable accommodation for them; there is consequently at present no asylum in the town for those afflicted with this painful malady.

4th. I beg to bring these circumstances to the notice of His Honor the Deputy Governor of Bengal, and solicit his permission to construct or hire a temporary building in the vicinity of the Police Hospital, for Small Pox patients, should the disorder continue on the increase and demand my interference; and that I be further authorized to incur such other incidental charges as may be actually necessary to their care and comfort: the Police Surgeon will afford the required medical assistance.

(Signed) J. H. PATTON,
Chief Magistrate.

This application was promptly and generously met by the Deputy Governor of Bengal, who, after consulting the Medical Board upon the expediency of the measures proposed by Mr. Patton, and receiving their additional suggestions, gave immediate sanction to the establishment of a number of Small Pox Hospitals in different parts of the town and suburbs, fitted up for the reception of 12 patients each; and each was to be under the charge of one of the educated Native youths, who had lately received the Diploma of qualification after due examination from the Medical College. An increase was also sanctioned in the Vaccine Establishment, and weekly reports were directed to be made to the Supreme Authority through the Chief Magistrate, both of the working of the Hospitals, and the demand for Vaccine protection.

From the Secretary to the Government of Bengal,

To the Medical Board,

Dated 18th March, 1844.

Gentlemen,

I am directed by the Hon'ble the Deputy Governor of Bengal, to acknowledge the receipt of your letter, No. 32, of the 12th instant, enclosing a communication of the same date from Dr. Stewart, and recommending the adoption of certain measures for arresting the progress of the Small Pox in this City, in addition to those advised by that Officer and the Chief Magistrate.

2d. The accompanying copy of a letter this day addressed to Mr. Patton, will acquaint your Board with the instructions he has received.

3d. With reference to the other recommendations made by your Board, and the Superintendent General of Vaccination, I am directed to convey His Honor's sanction to them respectively ; you are therefore requested to instruct that Officer to entertain six additional Vaccinators for the Suburbs of Kidderpore and Cossipore,* also to purchase vaccine crusts at the rate mentioned *(a)* by the Superintendent General, and to publish the Advertisements he proposes in the Bengallee and English Newspapers.

*At 8 Rupees per mensem each.

(a) Viz. 4 Annas for every well preserved and good crust. "These are found to be the least fallible, and the best mode of transmitting Vaccine lymph to the distant Provinces, so that there will be substantial *value received* for the money so paid. While this cannot therefore be viewed as a bribe, it will certainly be a great inducement to poor parents, both to have their children vaccined, and to take fitting care of them during the progress of the disease, so as to ensure good crusts on the 15th or 18th day."—D. S.

4th. Of the seven Sub-Assistant Surgeons who lately passed the examination at the Medical College, the five immediately available, as shewn in the margin, together with Moheschunder Dey appointed to Pootadaree, but who is still at the Presidency, are hereby temporarily placed at your disposal in order to your putting them severally in charge of the Small Pox Hospitals after communicating with Dr. Stewart and Mr. Patton.

Available passed Students.
1. Moheschunder Dey.
2. Dinoobundoo Dey.
3. E. Lazarus.
4. L. D'Souza.
5. Dhurmodoss Bose.
6. Rusick Loll Dutt.

5th. Your Board are requested, in conjunction with the latter Officer, to watch over the measures already adopted and now sanctioned, and to suggest such additional ones as may be required.

6th. The Deputy Governor of Bengal has noticed, with satisfaction, the favorable testimony borne by you, to the zealous and judicious management of the Vaccination Department by Dr. Stewart. His Honor is likewise glad to learn that Small Pox patients have not been denied admittance to the Charitable Medical Institutions of this Town, as stated in the first Report of the Chief Magistrate.

(Signed) A. TURNBULL,
Under Secy. to Govt. of Bengal.

From Under Secy. to the Governor of Bengal,

To J. H. Patton, Esq., Chief Magistrate of Calcutta,

Dated Fort William, 18th March, 1844.

Sir,

With reference to Mr. Secretary Halliday's letter, No. 335, of the 11th instant, I am directed to

forward the annexed copy of a communication from the Medical Board, with enclosure, and to intimate that the several recommendations therein made by the Board, and the Superintendent General of Vaccination, have been sanctioned by His Honor the Deputy Governor.

2d. You are accordingly requested to hire or erect immediately the temporary buildings, suggested in paras. 3 to 5 of the Board's letter for the receipt of Small Pox patients.

3d. Of the Sub-Assistant Surgeons whose services are available, one will be appointed temporarily under Dr. Maxton, the Police Surgeon, and the others will be distributed among the several Small Pox Hospitals, as the Board, in communication with yourself and Dr. Stewart, may deem advisable.

4th. You are authorized to entertain the Establishments recommended by the Board, and to appoint the Servants composing them, with the exception of the Compounders, whom Dr. Stewart will select.

5th. Until further notice you will be pleased to report weekly the number of patients admitted into the Temporary Hospitals, and the results, furnishing at the same time similar information regarding persons vaccinated.

6th. The Deputy Governor will expect you to watch over the measures adopted to check the progress of the disease, and, in communication with the Medical Board, to suggest such others as may be required.

(Signed) A. TURNBULL,
Under Secy. to Govt. of Bengal.

It happened that before these Hospitals were long enough established to be known and appreciated rightly by the people, the epidemic began to decline. The Hospitals did not become popular, the young men appointed to them, fresh from their studies, were inexperienced in the *management* and responsibilities of such Institutions. Influenced by an anxiety to be useful, which did them much credit, several of them were eager in search of patients, and in endeavours to persuade such as they found to enter their Hospitals and be treated "secundum artem;"—one or two failing in these efforts, undertook to attend patients in their own houses, and found better welcome in the discharge of this benevolent office, of questionable utility. But the Hospitals remained nearly tenantless, and after six weeks fruitless trial were closed. The grievous want of success which attended these liberal, well-intentioned, and well-devised, but tardy measures for the benefit of the suffering poor deserves more than a passing notice. The causes of it are, I fear, not of local or of recent origin, nor confined to Calcutta, but are prevalent all over Bengal. Enslaved by the trammels of a degrading religion, by which their thoughts are chained, their reasoning faculties hoodwinked, and their natural affections thwarted, all offers of even the most simple, obvious, and unquestionable temporal advantage to the recipient, and of undeniable and acknowledged liberality and good will on the part of the bestower, if involving the slightest deviation from ancient usage, are received by the Bengallee, not with the modest and thankful accord of silent gratitude, but with timid and suspicious, more than Trojan horror, perchance with the apathetic

declaration of entire submission to the decrees of fate. If accepted at all, it is with the unblushing demand for pecuniary *reward* for compliance with "master's orders," or "master's pleasure," or with the fawning and false semblance of a pleased acquiescence.

Statistics of Small Pox.—The Hospitals have thus furnished but few data for the compilation of Tables illustrative of the Statistics of Small Pox. The inmates being generally of the very lowest and most miserable classes, houseless and starving wanderers, the benefits derived from medical treatment in these Institutions may be without unfairness placed second to those of wholesome food, shelter and cleanliness, which the patients there received. The mortality in the Hospitals has been considerable, and the severity of the disease was very great in all the cases. A majority of the patients appeared to have been totally unprotected. Few or none, as far as could be ascertained, had ever been vaccinated. Of those who were cured none were discharged until several weeks after recovery, when they went out stouter and stronger than they had probably been for many a previous day. Those who continued ailing, and whose convalescence was tedious and retarded by some of the sequelæ of Small Pox, were transferred to the Police Hospital and are doing well. The following Table exhibits the amount of admissions, deaths and discharges in the different Hospitals, from 1st April to 1st June 1844, and the character of the disease in each case.

Number of Native Patients received into each of the temporary Small Pox Hospitals, from 1st April to 1st June, 1844.

Form of the Disease.	Stations.	Admitted.	Discharged.	Died.
	Park Street Hospital.			
Distinct, ...	.....	11	10	1
Confluent, ...	.....	10	4	6
	Police Hospital.			
Distinct, ...	.....	1	1	0
Confluent, ...	.....	5	2	3
	Bhowanypore Hospital.			
Distinct, ...	.....	12	9	3
Confluent, ...	.....	3	0	3
	Chandney Hospital.			
Distinct, ...	.....	3	2	1
Confluent, ...	.....	1	0	1
	College Street Hospital.			
Distinct, ...	.....	4	3	1
Confluent, ...	.....	5	2	3
	Chitpore Hospital.			
Distinct, ...	.....	6	1	5
Confluent, ...	....	5	2	3
	Gurranhatta Hospital.			
Distinct, ...	.....	0	0	0
Confluent, ...	.....	3	1	2
		69	37	32

Abstract of 69 *Cases of Small Pox, treated in the Small Pox Temporary Hospitals, and* 22 *Cases attended at their houses, during the months of April and May* 1844.

Form of the Disease.	Previously Vaccinated.			Previously Inoculated.			Unprotected.			Previously had natural Small Pox.			Unascertained.		
	Treated.	Died.	Recovered.	Treated.	Died.	Recovered.	Treated.	Died.	Recovered.	Treated.	Died.	Recovered.	Treated.	Died.	Recovered.
Confluent,	0	0	0	3	3	0	24	16	8	2	0	2	8	3	5
Semiconfluent,	1	0	1	1	0	1	14	3	11	0	0	0	4	0	4
Distinct,	0	0	0	0	0	0	29	26	3	0	0	0	2	1	1
Modified,	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Total,	4	0	4	4	3	1	67	45	22	2	0	2	14	4	10

Total treated 91—whereof died 52—recovered 39.

Compiled from the Records of the Medical Board by Dr. Stewart, 10th June 1844.

The admissions into the General Hospital were all Europeans, the majority had been vaccinated in infancy; four cases only proved fatal out of 16 admitted.

The following Table exhibits the number of admissions, deaths and discharges of this class into the General Hospital. Further particulars regarding many of the cases will be found in the interesting communications of Drs. Jackson and Rankin, subsequently given.

List of Small Pox Cases treated in the Presidency General Hospital, since 1st January 1844.

Number.	Names.	Age.	Occupation.	Date of Admission.	Date of Discharge.	Date of Death.	Description of Disease.	How many days ill previous to admission.	Number of days in Hospital.	Whether previously Vaccinated or not.	Remarks.
1	Peter H. Rogers,...	52	Pauper,.....	Jan. 29,	„	Feb. 8,	Confluent,...	3 days,	10	Yes.	
	Catherine Shea, ...	10	Ditto, ...	Feb. 11,	Feb. 22,	„	Distinct,.....	3 „	11	Yes.	
	Mary Young, ...	13	From School,	„ 18,	Mar. 18,	„	Confluent,...	4 „	29	Yes.	
	Mark Samples,.....	19	Seaman,.....	„ 18,	Feb. 29,	„	Ditto, ...	Several „	11	Yes, ...	Small Pox
5	William Haley,.....	26	Coachman,...	„ 21,	„	„ 22,	Malignant,...	4 „	1		appeared 3
	William Lloyd,.....	17	Mariner, ...	„ 21,	„ 24,	„	Modified, ...	.....	3	Yes.	days after ad-
	Mary McKoy, ...	13	From School,	„ 25,	Mar. 18,	.....	Confluent,...	4 „	22	Yes.	mission.
	Charlotte Littlefield,	4	„ Town,	„ 27,	.....	„ 28,	Hemorrhagia,	4 „	1	Yes.	
	Jane Burns, ...	15	Ditto, ...	Mar. 10,	Mar. 20,	.....	Confluent,...	3 „	10	Yes.	
10	David Brown, ...	8	From School,	„ 23,	April 8,	.....	Distinct, ...	5 „	16		
	Sarah Cox, ...	28	Pauper,.....	„ 27,	May 5,	.....	Confluent,...	8 „	39	Yes.	
	Louviana Rayment,	11	Ditto, ...	„ 29,	April 25,	.....	Distinct, ...	3 „	27	Yes.	
	James Sherlock, ...	20	Constable,...	„ 31,	„ 15,	.....	Modified, ..	.....	15	Yes, ...	Eruptions
	John Thorpe, ...	21	Seaman,.....	April 11,	.....	April 18,	Confluent,...	5 „	7	Yes.	appeared on
15	Frederick Marshall,	18	Townsman,	„ 18,	May 7,	.....	Modified, ...	5 „	20	Yes.	the night of
16	James Wilson,.....	6	Pauper,.....	May 20,	.....	.....	Distinct, ...	8 „	.....	No.	admission.

(Signed) S. NICOLSON, *Surgeon, General Hospital.*

I am indebted to Mr. Egerton for the following:

Return of Out Patients who have attended at the Eye Infirmary on account of Disease of the Eyes following Small Pox, from 26th Ferbuary to 13th June 1844.

	Diseases.								
Number of Case.	Ulcer of the Cornea.	Obstruction of the Nasal Duct.	Chronic Ophthalmia.	Slough of the Cornea.	Interstitial Abscess of the Cornea.	Opacity of the Cornea.	Prolapsus Iridis.	Pus in the Anterior Chamber.	Total.
	21	2	10	17	4	8	3	1	66

Return of House Patients who have been admitted into the Eye Infirmary on account of Disease of the Eyes following Small Pox.

Number of Cases.	Diseases.				
	Prolapsus Iridis.	Slough of the Cornea.	Interstitial Abscess of the Cornea.	Ulcer of the Cornea.	Total.
	..... 1	..... 2	..... 2	..... 1	 6

(Signed) C. C. EGERTON,
Surgeon to the Eye Infirmary.

Calcutta,
13*th June*, 1844.

By the obliging assistance of Captain F. W. Birch, Superintendent of Police, I have been able to collect some authentic particulars regarding the fatality of Small Pox generally in Calcutta, and during certain seasons of its Epidemic prevalence. Of this latter there have been 3 examples during the past 12 years, the first occurred in 1832-33, the second in 1837-38, and the third in 1843-44. The last according to all information is the most severe which has occurred in Calcutta since 1796. I have not been able to obtain any accurate account of that Epidemic, nor indeed of any previous to that of 1832-33.

The following Table A, exhibits the course of these Epidemics, severally and successively, among the Hindoo and Mahomedan population. It is compiled from a registry of Native deaths kept by the Police authorities at the different Ghats and Gorastans ,where alone the funeral rites of cremation and interment are permitted to the Hindoo and Mussulman inhabitants respectively. This system of registering deaths was introduced by Mr. Blacquiere in 1802, and seems so simple and facile that it is much to be regretted it is not adopted in every populous town in Bengal. The records are written in Bengallee, and state in tabular detail the name, age, sex, caste, residence, occupation, disease, duration of sickness, &c., of each individual deceased. The translated official copies of these reports enumerate however only the actual number of bodies "burnt," or "floated" at the Ghats, or "buried" in the Gorastans, while the diseases are roughly classed under three heads, viz. *Cholera*, supposed to be the chief scourge of the population, *Small Pox*, said to be the second, and *Miscellaneous diseases*

including all the rest. The original documents are not preserved, but I have been able to secure during the present (and on other occasions,) a sufficient number to furnish forth several very interesting Tables. Before submitting these it is necessary to say a few words on the character and amount of the town population to which exclusively they refer.

Population.—This has been very variously estimated and is not exactly known. The difficulty of ascertaining the amount with accuracy, arises from the floating and migratory character of the people. Strangers are always struck with the paucity of *children* and the small number of *old men* to be seen in the streets or about House-doors. The reason is that the inhabitants are generally but temporary dwellers in town; the great majority of Hindoo day laborers have their homesteads in the country; many travel into town every morning from distances of 6 and 8 miles, or from the other side of the River Hooghly, crossing it in crowded and frail canoes, and returning at night. The number of such prœdial laborers is ascertained to be not less than 1,75,000: Even of the dwellers in town by far the greater number are young men, who leave their families in the country and visit the capital in bands, like Irish reapers, for a season or for a few years, until they amass enough to enable them to visit their homes, and enjoy the luxury of idleness for a few months, when they return again or are pensioned off by their younger relatives; Even the domestic servants of Europeans adhere to this practice, and no English family ever lived long in Calcutta without experiencing the vexations of the "*Budlee*" system.

A peculiarity in consequence exists in the character of this population, which though startling is easily accounted for; it is *stationary* in amount, with a great excess of adults; a very careful census was made by Captain Birch in 1837, which assigned the entire population of all creeds, castes, and countries at 2,29,714 souls. By means of the same agents and with the same care and supervision he made another census in 1843, when it was found that the Native population was rather *less* than in 1837.

The European community on the contrary is rapidly on the increase both in wealth and number; substantial puckah houses in certain quarters have began to replace the frail and filthy tenements lately occupied by low caste Hindoos, while the Native part of the City of Palaces, though containing not a single house older than the days of Clive, exhibits all the attributes of age and decay as much as any of the oldest cities of India, retaining all the original imperfections of narrow and crowded streets, impure drains and sewers, small and ill ventilated houses and filthy cess pools, tanks and privies. Could Mr. J. R. Martin have paid us a visit in April of this year he would have found the truth of his predictions fully and painfully corroborated when he wrote thus. "In the event of a contagious disease (and there is "no reason why such should not occur here) the "dense state of the Burra Bazar and surrounding "parts, the want of water courses and means of "facility for removing accumulations of filth, &c. "will stand as insuperable bars to the best devised "regulations of Medical Police. (Vide Topographical "Memoir," p. 19.)

In making the following calculations of proportionate mortality to population I have thought it fair on the whole to allow 158,000 as the average number of Hindoos living, including high castes and out castes of every sort, 58,000 as the probable number of Mahomedans, 12,000 as that of Europeans, Eurasians and other Christians, and 2,000 to include Chinamen, Mugs, Parsees, Madrassees and other Oriental Foreigners. This will make the whole living population amount to 230,000, which number, notwithstanding the ravages of disease and the drains of emigration is maintained by the ready and constant compensating immigration, and the Births though these are few. The registered Births in one year (1838) amounted to 2,781, whereof 1,639 were Males and 1,142 Females.

General Mortality.—During the 12 years, just expired, viz. from 1832 to 1843 inclusive, it is found that the total mortality has been 132,551, that is 11,045 per annum, or 5·11 per cent. The entire Native population may thus be said to undergo extinction and renewal once in 20 years. The average annual mortality among the Hindoos is 8,862, or about 5·6 per cent. that of Mahomedans is 2,183, or exactly 3·7 per cent.

Mortality by Small Pox.—The following Table exhibits the mortality of both classes of Natives caused by Small Pox for every month of 12 years. The total is 815 Mahomedans and 4,810 Hindoos, giving an annual average for both together of 468 or 1 death in 458 living.

TABLE A.

Table shewing the Native Mortality by Small Pox in Calcutta for every Month during a period of 12 Years, (from the Ghat and Ghorustan Registers.)

MONTHS.	1832.		1833.		1834.		1835.		1836.		1837.		1838.		1839.		1840.		1841.		1842.		1843.		Total of Months.	1844.	
	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.	Mahomedan.	Hindoo.		Mahomedan.	Hindoo.
January,	16	0	76	245	0	0	0	1	1	0	0	1	4	69	0	10	0	0	0	0	1	0	0	0	424	66	91
February,	17	1	55	353	0	1	8	2	0	0	1	4	10	156	0	0	0	0	4	2	0	1	1	0	616	215	240
March,	10	12	32	612	0	3	0	6	0	1	5	14	38	283	1	21	0	5	13	4	1	6	1	8	1076	415	548
April,	2	74	49	587	2	12	2	11	0	0	1	31	41	465	4	23	0	5	7	7	1	4	8	13	1349	263	493
May,	5	99	16	277	0	6	2	9	11	1	4	51	20	230	4	9	0	4	1	3	3	3	6	13	778	127	248
June,	8	64	7	112	0	4	0	6	0	1	7	42	11	112	0	2	0	0	2	6	1	0	20	35	440	42	108
July,	6	57	55	38	5	1	4	2	0	0	3	41	4	41	0	0	0	7	0	1	0	1	16	91	373	19	28
August,	0	42	3	14	0	0	0	0	0	0	3	17	0	19	0	2	0	0	2	0	0	0	4	11	114	2	11
September,	70	30	0	6	0	0	0	0	0	0	3	3	0	3	0	1	0	0	0	1	0	0	3	9	132	1	5
October,	30	17	0	10	0	1	0	0	0	1	2	1	0	1	0	4	0	0	3	0	0	1	8	8	87	1	1
November,	10	34	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	2	11	61		
December,	16	59	0	1	0	0	0	0	0	0	3	28	0	0	0	0	0	0	0	0	0	1	19	49	176		
Total,	190	489	293	2255	7	29	16	37	12	4	33	233	128	1379	9	72	0	22	32	24	7	18	88	248	5625		
	679		2548		36		53		16		266		1507		81		22		56		25		336		.....		

As compared with other Diseases.—The mortality caused by Small Pox as compared with other diseases would be but imperfectly discovered by contrasting it with Cholera, (the only other disease whereof special record is kept at the Ghats.) Some years ago in order to ascertain the comparative fatality of all diseases among the Natives, I procured translations to be made of a mass of these Native records so as to complete a total of 20,000 deaths. This Table was printed in the Journal of the Calcutta Medical and Physical Society in 1839, but as connected with the present inquiry and otherwise interesting, is introduced here.

TABLE B.

Table shewing the Diseases causing Deaths, and the respective Ages of the deceased, in 20,000 *cases of Hindoo mortality, within the Town of Calcutta, during the years* 1834-35-36-37-38.—*Translated and tabulated from the records of the Ghâts.*

Age from birth to	Fevers.				Disease of Digestive Organs.						Disease of Respiratory Organs.		Diseases of Nervous System.			Diseases of General System.				Accidents and anomalous Disease.		Total of each Sex.		
	Simple.	Intermittent.	Typhus.	Eruptive.	Diarrhœa and Dysentery.	Cholic.	Disease of the Rectum	Diseased Liver	Spleen.	Cholera.	Cough.	Asthma.	Paralysis.	Epilepsy.	Tetanus.	Rheumatism Gout.	Diabetes Dropsy.	Syphillis.	Leprosy.	Death By hanging. „ drowning. „ falling. „ Snake bite. Hemorrhage.	Diseases of Child-bed.	Males.	Females.	Total.
1 year,	25	3	248	41	126	0	0	0	5	86	6	1	0	8	2	0	2	0	1	10	1237	983	818	1801
2 „	12	2	138	21	195	0	0	1	12	75	6	0	0	1	3	1	9	0	0	10	3	254	235	489
3 „	7	11	149	26	196	0	1	1	12	78	1	0	0	3	5	3	8	2	0	6	0	274	235	509
4 „	8	4	75	30	127	0	0	0	5	75	2	0	0	0	1	4	1	0	0	2	0	181	149	330
5 „	4	3	106	32	101	0	0	0	6	72	0	1	0	2	4	1	0	3	0	12	0	224	126	350
6 „	5	0	56	21	75	0	0	0	7	56	3	2	2	0	2	0	2	0	0	2	0	141	92	233
7 „	4	3	59	17	65	0	0	0	9	57	1	0	1	0	3	2	3	0	0	7	0	112	119	231
8 „	2	4	41	16	63	0	0	0	6	46	2	0	1	0	0	2	0	0	0	2	0	91	94	185
9 „	0	0	49	17	44	1	0	2	6	30	2	1	0	1	2	1	0	0	0	9	0	104	61	185
10 „	3	4	58	15	65	3	2	0	10	53	4	1	0	0	4	3	0	0	2	2	0	141	88	229
11 „	6	3	45	13	20	1	0	0	8	34	0	0	1	0	3	0	2	0	0	3	0	88	55	139
12 „	3	6	75	24	59	0	0	3	16	66	2	2	0	0	2	3	0	0	0	9	0	150	120	270
13 „	2	3	34	11	13	0	0	0	12	36	4	0	0	0	3	0	1	0	1	3	4	79	48	127
14 „	5	11	70	7	50	1	0	0	13	44	4	1	1	1	2	0	2	1	0	5	2	122	96	218

TABLE B.—*Continued.*

Age from birth to	Fevers.				Disease of Digestive Organs.						Disease of Respiratory Organs.		Diseases of Nervous System.			Diseases of General System.				Accidents and anomalous Disease.		Total of each Sex.		
	Simple.	Intermittent.	Typhus.	Eruptive.	Diarrhœa and Dysentery.	Cholic.	Disease of the Rectum.	Diseased Liver.	Spleen.	Cholera.	Cough.	Asthma.	Paralysis.	Epilepsy.	Tetanus.	Rheumatism Gout.	Diabetes Dropsy.	Syphillis.	Leprosy.	Death By hanging. „ drowning. „ falling. „ Snake bite. Hemorrhage.	Disease of Child-bed	Males.	Females.	Total.
15 years,	3	1	63	14	32	0	0	0	8	58	5	2	5	2	1	1	2	1	1	4	6	129	80	209
20 „	28	45	551	65	365	17	10	2	55	466	70	9	11	0	9	14	8	5	6	31	8	1131	645	1776
30 „	45	41	1037	81	761	8	1	4	47	1293	185	12	5	6	31	11	13	11	7	25	37	2672	998	3670
40 „	46	36	817	17	717	22	3	4	17	896	125	23	5	5	8	35	12	10	5	64	26	1995	898	2893
50 „	21	29	509	8	594	9	2	7	12	600	98	9	8	0	11	10	19	2	5	31	2	1326	661	1987
60 „	22	29	412	2	557	14	6	3	7	308	52	15	12	5	4	23	17	2	4	43	3	970	570	1540
70 „	7	15	206	4	363	2	0	1	5	153	29	13	7	0	2	10	19	3	2	14	0	463	392	855
80 „	17	12	227	4	621	4	2	5	0	137	59	15	20	2	12	15	2	5	4	13	0	511	665	1176
90 „	3	6	66	2	229	1	0	0	0	36	10	8	4	0	0	8	3	0	2	0	0	148	230	378
100 „	4	1	27	0	171	2	0	0	0	16	2	5	0	0	0	0	3	0	1	2	0	62	178	240
Total,...	282	272	5118	488	5620	86	27	33	278	4773	672	120	83	36	114	147	128	45	41	309	1328	12347	7653	20000
	6160				6044					4773	792		233			361				309	1328			

The classification of the multifarious diseases in the Bengal Nosology, 43 in number, into something of Physiological order, has been attempted.

The chief difficulty arose from the absurdity of the nomenclature used to designate particular diseases in the original, which partakes largely of the antiquated humoral pathology, and not a little of fancy and witchcraft. The following is the list of diseases.

List of Diseases assigned in the Bengallee Registers of Mortality translated, numbered and classified, to accompany Table marked B.

Class of Diseases.	English Name.	Bengallee (Romanised) Name.	Literally.
Fever.	Fever, ...	Jar, ...	Continued Fever.
	Intermittent ditto,	Bisham Jar, ... / Pala Jar, ...	Intermittent Fever.
	Typhus ditto, ...	Bikar,..... / Sannipat, ...	Varieties of Typhus.
	Eruptive ditto, ...	Basant,.....	Small Pox.
		Ham,.....	Measles.
Diseases of the Digestive Organs.	Diarrhœa and Dysentery, ...	Grihni,.....	Diarrhœa.
		Sat Grihni, ...	Ditto with Dropsy.
		Amasai, ...	Mucus ditto.
		Amrakta,.....	Dysentery.
		Rakta Atisar, ...	A variety of ditto
		Jar Atisar, ...	Ditto with Fever.
	Cholic, ...	Soolbedna, ...	Cholic.
	Diseases of the Rectum, ...	Bhagandar, ...	Fistula in Ano.
		Arsa,.....	Piles.
	Diseases of the Liver,.....	Agramas,.....	Induration of Liver.
		Pandur, ...	Jaundiee.
		Neba.....	Jaundiee variety.
	Spleen Diseases, ...	Pilai,.....	Enlarged Spleen.
	Cholera,.....	Oolaoota, ...	Cholera.
Diseases of the Respiratory Organs.	Cough, ...	Kas, ...	Cough.
	Phthisis, ...	Jakhya Kas,.....	Ditto with bloody expectoration. Phthisis.
	Hooping Cough, ...	Haupani Kas, ...	
	Asthma, ...	Khya Kas, ...	
Diseases of Nervous System.	Paralysis,.....	Pokya Ghat, ...	Paralysis or Palsy.
	Epilepsy, ...	Mirgi, ...	Epilepsy.
	Tetanus, ...	Dhannook Tunkar,.....	Tetanus or Cramp.
	Mental Derangement,	Uparabearam, ...	Hysterea, Chorea, Madness, &c.

Class of Diseases.	English Name.	Bengallee (Romanised) Name.	Literally.
Diseases of General System.	Rheumatism Gout, ...	Bat, ...	Rheumatism.
	Diabetes, ...	Bahumutra, ...	Diabetes.
	Dropsy, ...	Udari, ...	Dropsy.
	Syphillis, ...	Gormi, ...	Syphillis.
	Ditto, ...	Pinas, ...	Ditto with Ulceration of the Nose.
	Leprosy, ...	Mahabyadhi, ...	Leprosy.
	Gangrene, ...	Poschima, ...	Gangrene.
Accidents and Anomalous Diseases.	Death by hanging,	Golai Dorydya Mare, ...	Death by hanging.
	Ditto „ drowning,	Jale Dube Mara,	Ditto by drowning.
	Ditto „ falling, ...	Gachaoota Pura Mara, ...	Ditto by falling from a tree.
	Ditto „ Snake bite,	Sarpe Ghat, ...	Ditto by Snake bite.
	Scrofulous Joints, ...	Urastambo, ...	Inflammation of knee joint.
	Spontaneous Hemorrhage, ...	Raktapitti, ...	Hemorrhage from Nose and Mouth.
	Diseases of Lying-in Women and their Children, ...	Antoore Rog, ...	Diseases of Lying-in Women and their Children.

Reviewing this Table we find that Fevers (including the excuthemata, viz. Small Pox and Measles) hold the first place, Dysenteries the 2d, Cholera the 3d, diseases of Child-bed the 4th, diseases of the Respiratory Organs the 5th, those of the General System the 6th, diseases of Innervation the 7th, and Accidents the last place in the scale of fatality.

An explanation is necessary regarding the "diseases of Child-bed" which stand 4th in the list: the term employed to include all casualties occurring during or immediately after labor is "*antari-rog*," it is applied indiscriminately to the infant or the mother, and attributes the fatal event to demoniacal influence. Children still-born are not included; the number said to have died on the first day of life was ascertained to be 356, on the 2d 208, on the 3d day 146, on

the 4th 88, on the 5th 89, on the 6th 49, on the 7th 46, and the rest, with exception of 17, died within the month, so that no part of this mortality could be the effects of dentition, to which may probably be referred the small number of 10 set down under the head of "nervous diseases," fits, &c. during the 1st year. Of 88 mothers who lost their lives in child-birth, four appear to have been no older than 14, six were aged 15, and eight died between the age of 15 and 20.

The Table exhibits a prevalence of fatal disease at the period of middle life which can only be accounted for on one of two suppositions; either the climate is peculiarly favorable to infancy and old age, or the adult population of Calcutta is swelled by immigration, and is greatly in excess; both explanations are probably true.

According to the Carlisle Tables the mortality in England during infancy is very much greater than in Calcutta; but from the age of 6 upward to 60 the advantage is enormously in favor of England. From 60 upwards again, if the Ghat Returns can be depended on, the advantage is on the side of Calcutta, and it seems natural enough that the climate favorable to infancy should be equally so to the feebleness of age. At the other periods of life the rate of casualty appears to be three or even four times as great as at Carlisle.

The influences of Age, Sex, and Occupation upon the intensity or duration of Small Pox in individuals are shewn in the subjoined Table C, which gives the particulars of 1,000 fatal cases of Hindoos, which occurred within the town of Calcutta during the months of March and April 1844.

TABLE C.

Particulars of 1000 *fatal Hindoo Cases of Small Pox in Calcutta, for March and April* 1844.

Castes and Occupation.			Sex.		Total.	Age.		Duration of illness.	
Bengallee Name.		Translation.	Male.	Female.		Years.	Cases.	Days.	Cases.
কায়েস্থ,...	Caist,.....	Writer, ...	71	64	135	0	42	1	0
তামলী,...	Tamly, ...	Beetul Dealers, ...	8	2	10	1	73	2	5
ছুতোর,...	Chooter,...	Carpenter, ...	24	13	37	2	62	3	8
ধোবা, ...	Dhobah,...	Washers, ...	30	31	61	3	50	4	15
কৈবর্ত্ত,...	Kyburt,...	Cultivators, ...	46	35	81	4	54	5	30
নাপীত,...	Napeet,...	Barber, ...	12	10	22	5	76	6	27
গোয়ালা,..	Goalah,...	Cow-keeper, ...	25	20	45	6	50	7	59
বাগদী, ...	Baugdy,...	Menial, ...	26	40	66	7	46	8	60
তেলী, ...	Talee, ...	Oilman, ...	5	1	6	8	31	9	56
সোনার বেন্যা,	Sonarba-neah, ...	Money Changer,	35	16	51	9	26	10	85
তাঁতি, ...	Tanty, ...	Weavers, ...	21	18	39	10	36	11	125
ব্রাহ্মন, ...	Brahmun,	Priests, ...	50	33	83	11	27	12	135
পোদ, ...	Pode,.....	Low Cultivator,...	4	2	6	12	21	13	111
কোলু, ...	Coloo, ...	Oilmen, ...	9	7	16	13	16	14	79
কাঁশারি,..	Kausary,	Braziers,.....	14	8	22	14	24	15	59
শুঁড়ী, ...	Soory, ...	Spirits Dealer, ...	2	5	7	15	25	16	46
চুনারি, ...	Choonary,	Lime Dealers, ...	0	1	1	16	34	17	27
হালওয়াই,	Hallwoye,	Confectioner,.....	14	6	20	17	24	18	16
বৈষ্টম, ...	Bystome,	Mendicants, ...	24	39	63	18	21	19	11
সর্ন্নকার,..	Surnakar,	Goldsmith,.....	6	7	13	19	5	20	13
সতগোপ,	Shutgope,	Cow-keeper, ...	8	7	15	20	50	21	10

Castes and Occupation.			Sex.		Total.	Age.		Duration of illness.	
Bengallee Name.	Translation.		Male.	Female.		Years.	Cases.	Days.	Cases.
ময়রা, ...	Moyrah,...	Sweetmeatseller,	4	4	8	21	6	22	10
কামার,...	Kahmar,...	Blacksmith, ...	7	9	16	22	9	23	6
ক্ষেত্রী, ...	Khettree,	Up-country Military Caste,...	5	5	10	23	5	24	0
বৈদ্য, ...	Byddow,...	Doctor, ...	1	0	1	24	19	25	2
দূল্যা, ...	Dooleah,	Bearer, ...	19	7	26	25	39	26	0
জেল্যা, ...	Jaileah,...	Fisherman, ...	13	9	22	26	15	27	0
আগুরি,...	Augoory,	Shopkeeper, ...	3	4	7	27	4	28	0
গন্ধবেন্যা,	Gundabaneah,	Druggists, ...	10	4	14	28	6	29	0
হাড়ী, ...	Hawry, ...	Sweepers, ...	8	4	12	29	1	30	3
জুগী, ...	Joogy, ...	Religious Mendicants, ...	1	1	2	30	34	...	...
ডোম, ...	Dome, ...	Basket Maker, ...	4	7	11	31	1	...	...
কপালী,...	Copally,...	A low elass Weaver, ...	5	3	8	32	14	...	...
কাওরা,...	Cowrah,...	A Cook and Chowkeedar,	9	10	19	33	1	...	...
রোজপূত,	Rogepoot,	Military, ...	1	1	2	34	3	...	...
কুমর, ...	Coomer,...	Potter, ...	4	8	12	35	1	...	...
মুচী, ...	Moochee,	Shoes Maker,.....	7	10	17	36	1	...	...
কুরমী ,...	Coormy,...	Low Up-country Chowkeedars,	8	4	12	37	0	...	...
মালাকার,	Mallakar,	Flowers Dealers,	1	0	1	38	0	...	...
.....	.....	.....	...	...	...	39	1	...	...
.....	.....	.....	...	...	...	40	7	...	...
.....	.....	.....	...	...	...	50	16	...	...
.....	.....	.....	...	...	...	60	13	...	...
.....	.....	.....	...	...	...	70	12	...	...
.....	.....	.....	544	456	1000	...	1000	...	1000

Comparing the above Statements with such information as I possess relative to the previous Epidemic of 1838, I find that in that year out of 820 fatal cases, the particulars of which were traced, 489 were males and 331 females.

The age of a certain number of fatal Hindoo cases in each season was—

Year.	Total fatal Cases.	Under 5 years	From 5 to 10 years.	From 10 to 15 years.	From 15 to 20 years.	From 20 to 25 years.	From 25 to 30 years.	From 30 years upwards.
1837-38.	820	253	195	87	103	80	46	56
1844.	1000	357	189	113	133	78	60	70

The duration of illness from seizure till death, in a certain number of cases during each Epidemic, was found to be—

Year.	Total fatal Cases.	4 Days	8 Days.	12 Days.	16 Days.	20 Days.	24 Days.	28 Days.	32 Days.
1837-38.	488	16	66	134	199	45	20	7	1
1844.	1000	28	176	401	295	67	28	2	3

The greatest number of deaths would appear to happen about the 5th, 12th and 16th days of illness; and without attaching undue importance to the doctrine of critical days it would appear that a certain number succumb to the violence or "malignancy" of the incursive fever, a somewhat larger proportion fall victims to the exhaustion of the maturative process, and the majority to the reaction of the secondary fever.

Localities of Small Pox.—The Town of Calcutta is, for the purposes of Police superintendance and control, partitioned into four nominal "Divisions," to each of which, until lately, there was assigned a separate Magistrate. Each Division is farther parted into small Police Stations or Tannahs, the duties of which are discharged by a Native Officer styled the "Tannahdar," and a numerous body of subordinate Police Peons, with one or two English Constables; the whole establishment being under the immediate superintendance of an experienced Military Chief, (Captain F. W. Birch) to whom all reports are made, and through whom all enquiries and investigations are conducted. The Tannadars being from their youth brought up in connection with the department, and selected eventually on account of their shrewdness, good character, activity and intelligence, are in general well acquainted with the character and circumstances of the people residing under their daily observation, and take note of all matters affecting the public peace which occur within their own district. So that, notwithstanding the somewhat inquisitorial appearance of the proceeding—and the extreme objection entertained by all orientals to be questioned

about their families, or even to mention their women except in metaphorical language, it has been found no very difficult matter in Calcutta, from time to time, to collect through their agency very fair information relating to the actual amount of the living population in any district, the proportion of the sexes, the number of children, and the occurrence of births and deaths in families. The accuracy of the latter statements in particular, Captain Birch thinks may be certainly relied upon, since the nature of the climate compels the almost immediate removal of every dead body from its late abode; and of the very miserable and indigent who die in the streets and bye-ways, the Police alone take any cognizance.

A glance at the accompanying Map of Calcutta, and a reference at the same time to the following Table D, will show how the population, Christian, Mahomedan and Hindoo, &c., is distributed through each Town, Division and Tannah. It will be seen that the 1st and 2d Divisions are what is commonly called the Native Town, the quarter chiefly inhabited by Hindoos and low castes; while the principal part of the European and Christian inhabitants occupy the more open district of the 4th Division, which is also largely shared towards its outskirts by the Mahomedan population, whose greater jealousy and more luxurious habits of life lead them to prefer separate dwellings and well-screened courts and gardens. The 3d Division is that where Mercantile people and Tradesmen of all classes chiefly live, or have their offices.

It is foreign to my present object to describe minutely the well known evil effects on public health

produced throughout the whole Native Town, and to a frightful extent in certain Tannahs, by the original defects and errors in the plan of the City—the distortion, the malposition and direction of its principal thoroughfares, the narrowness and confinement and consequent bad ventilation of its lanes and gullies, the bad construction and faulty arrangement of its dwelling houses, the smallness of the sleeping apartments, the perpetual dirty and damp state of the court-yards, the crowded condition of the inmates, the disgusting stench from the public cesses and privies, the stagnation of tanks, drains, and sewers, the scantiness and badness of the water supplied for domestic uses, &c. &c. All these matters have been often pointed out and lamented, talked of for a time, forgotten, and re-discussed on the recurrence of some sweeping pestilence, to be again consigned to temporary oblivion. The attempt to remedy them seems to be abandoned as too arduous and almost hopeless. The origin of all these evils, their number and extent, with descriptions of their actual effects, and plans for their removal or amelioration have from time immemorial engaged the consideration of individuals, and of Governments; and are they not all fully chronicled in faithful and filthy detail in the recently printed Report of the Municipal Committee, and in the ample pages of its voluminous Appendix. Sufficient information on the subject for general readers will be found in the able exposition of their results on civic health, contained in Mr. J. R. Martin's "Topographical Memoir of Calcutta." His predictions founded on close and long observation of the devastating mortality caused amid the dense population of

Bengal "*rice-eaters*," by the combination of such natural and artificial elements of disease as the climate and Town of Calcutta present, have been abundantly verified during the late Epidemic, and made it sufficiently easy to point out those Districts and Tannahs where pestilence would surely be found most rife—and death's harvest greatest.

The following Table D, constructed from the daily reports of the Tannadars, during the past nine months (from September to June) exhibits, together with the total actual mortality caused by Small Pox during that time in each Division and Tannah, some of the operating causes of the very striking difference observable in this respect between them, by showing the classified average living population contained within the limits of every Tannah; this may serve to prove, if farther proof is needed, the urgent necessity for some general and comprehensive reform.

TABLE D.

Shewing the Total Mortality of Classes, caused by Small Pox, from 1st September to 1st of June, in each Division and Thannah, the Population and area of each.

First Division.

Population of the Division.		Tannahs of the Division. Number.	Name.	Area in Acres.	Area in parts of a square mile.	Mortality by Small Pox. Christian.	Mahomedan.	Hindoo.	Total Mortality.
Christian, viz. European and East Indian,	16	1	Saum Bazar, ...	119½	⅕	0	2	43	45
		2	Baug Bazar,.....	73¼	1/9	0	17	58	75
		3	Shampooker, ...	159½	¼	0	15	69	84
Mahomedan, ...	7255	4	Churrukdangah,	41¼	1/16	1	10	47	58
		5	Jorasanko, ...	43½	1/16	0	6	35	41
Hindoo, ...	82004	6	Symlah, ...	190¼	⅕	0	3	45	48
		7	Sukeas' Street,...	124½	⅕	0	22	102	124
Armenian,.....	0	27	Coomartolly, ...	73½	1/9	1	6	45	52
		28	Hautkhollah, ..	94	1/7	0	3	59	62
Chinese,.....	0	29	Jora Baug, ...	126	⅕	0	3	40	43
		30	Cubberdangah,...	27	1/32	0	0	17	17
Other Asiatics,	5632	31	Susteetollah, ...	83	⅛	0	1	14	15
Total,.....	94907	...	.....	...	...	2	88	574	664

Second Division.

Christians,.....	4013	8	Puttledangah, ...	76	1/9	13	61	109	183
		9	Thuntuneah, ...	76½	⅛	0	9	41	50
Mahomedans,...	21059	10	Matchoo Bazar,	49	1/12	0	33	30	63
		11	Colootollah,.....	25	1/32	23	29	67	119
Hindoos,.....	34736	12	Chunamgolly ...	20	1/32	20	16	7	43
		13	Mirzapore, ...	97½	1/6	0	23	28	51
Armenians, ...	621	14	Moocheeparah,...	64	1/10	0	6	30	36
		15	Lall Bazar, ...	31½	1/19	16	45	33	94
Chinese,.....	107	32	Burroo Bazar, ..	61	1/10	0	20	20	40
		34	Amratollah,.....	21½	1/32	4	17	4	25
Asiatics,.....	4317	35	Clive Street,.....	41¼	1/16	0	0	1	1
		36	Lall Diggee,.....	34¾	1/16	0	3	0	3
Total,.....	64853	...	.....	...	...	76	262	370	708

THIRD DIVISION.

Population of the Division.		Tannahs of the Division. Number.	Name.	Area in Acres.	Area in parts of a square mile.	Mortality by Small Pox. Christian.	Mahomedan.	Hindoo.	Total Mortality.
Christians,.....	3729	16	Shibtollah, ...	25½	1/32	28	28	8	64
Mahomedans,...	6950	17	Gooreahtollah,...	49½	1/12	26	31	74	131
Hindoos,.....	9734	18	Puddopooker, ...	67¼	1/10	1	2	29	32
Armenians, ...	12	19	Chandney Choke,	29½	1/32	6	22	27	55
Chinese,.....	255	38	Larkins' Tanah,	97¼	1/7	0	1	0	1
Asiatics,.....	1773	39	Chaundpaul, ...	80¼	1/8	0	0	0	0
Total,.....	22453	...	.....	...	...	61	84	138	283

FOURTH DIVISION.

Christians,.....	3467	20	Talltollah,.....	72¾	1/9	76	271	233	580
Mahomedans,...	25358	21	Jaun Bazar,.....	65	1/10	10	59	80	149
Hindoos, ...	12004	23	Colingah,.....	104	1/6	12	150	36	198
Armenians, ...	3	24	Chouringhee, ...	71	1/9	0	26	9	35
Chinese,.....	0	25	Short's Bazar, ...	90	1/7	3	67	66	136
Asiatics,.....	10619	26	Bamun Busty,...	203	1/3	0	8	22	30
Total,.....	51451	...	.....	...	...	101	581	446	1128

As compared with former Epidemics, I find by reference to notes made during the season of 1838, that among the Hindoos dwelling in some of the worst Tannahs, the disease prevailed with even greater violence than on the present occasion.

Table exhibiting the comparative Mortality caused by the Epidemic Small Pox of 1837-38 *and of* 1843-44, *among the Hindoo Population of some notedly unhealthy Localities.*

Thannah.	Hindoo Population.	Epidemic of 1837-38, 12 Months.	Epidemic of 1843-44, 9 Months.
Bang Bazar,.....	5080	32	58
Shampokar, ...	12396	170	69
Churrukdanga, ...	4661	42	47
Jorasanka, ...	4868	33	35
Simleah, ...	9380	103	45
Sukeas' Lane, ...	6857	86	112
Mutchooa Bazar,.....	4105	37	63
Coomartolly, ...	4627	22	52
Hautkollah, ...	10121	53	62
Jorabagan, ...	10485	33	43
Cubberdunga, ...	6628	20	17
Total,.....	79208	631	603

I have not been able to discover how the disease was introduced into Calcutta this season. It has been ascertained however that the Epidemic did not enter the town from the Suburbs but burst out suddenly in the China Bazar, and did not until late in March spread to the populous Suburbs.

On applying to Mr. Mytton, Magistrate of 24-Purgunnahs, in the hope of obtaining information relative to the spread of the Epidemic in the Suburbs, I learned that "there are no Registers of Mortality" either among Men or Cattle kept up in the Suburbs. "It would be almost impossible," it was added, "nay

quite impossible with the establishment now existing, to approach any thing like accuracy in such statistical information. In the Town of Calcutta with a marked and distinct boundary, and the whole of the population crowded into a small space, and a Police some two or three times more numerous than is maintained for the whole country from Fultah Ghat to Saugor Island, the thing is different." Among the European and Native Troops at Dum Dum not a single case has appeared, and at Barrackpore only 4 cases, all in one Regiment, the 8th N. I., in April and May. At Howrah, I am told by Dr. Macpherson that the disease did not show itself previous to February, and not more than 12 or 14 cases altogether came under his observation in that populous district.

Influence of Season.—I have been favored by Mr. Rees, of the Hindoo College, and in charge of the Observatory, with a Meteorological Register for every month of each year from 1832 to 1st June 1844, but it is too lengthy for insertion; I therefore here introduce merely the observations for each month during the three periods, during which Small Pox prevailed as an Epidemic, viz. 1832-33, 1837-38 and 1843-44.

Mr. Rees writes to me on the 5th instant—" I regret that there are no instruments in the Observatory to indicate the strength of the wind nor the electric state of the air. In lieu thereof I have given two additional columns of the averages of maxima and minima pressures and temperatures; besides I have added two more, shewing the moon's horizontal parallax in perigee and apogee; these, on a second consideration are, I fear, of little if of any use at all, certainly not in a monthly exposition of mortality;

for taking for granted, that the proximity of the moon has influence on the human frame, and assuming the velocity of the moon's attraction to be 6,000 feet per second (this is from my own observations) her main attraction will only be felt for about 3 days after perigee, and the greatest absence of her influence for an equal period after apogee, the proximity of the moon being generally the same for equal short spaces of time before and after perigee and apogee, as one or two days; if then the times of these phenomena were compared with the mortality by any particular epidemic during three days after perigee and apogee, a satisfactory result would probably be the consequence. It would no doubt set at rest the question whether the moon exerts any influence on men or not."

TABLE E.

Meteorological Register in Calcutta during three Seasons of Small Pox Epidemy.

	Maximum Pressure.	Minimum Pressure.	Maximum Temperature.	Minimum Temperature.	Quantity of Rain.
	Observation for 1832.				
	Inches.	Inches.	°	°	Inches.
January,	30.071	29.949	74.1	54.6	0
February,	.027	.878	78.8	61.2	1.65
March,	29.921	.800	86.4	66.3	3.10
April,	.814	.702	92.2	74.9	2.36
May,	.716	.604	96.9	76.8	3.45
June,	.571	.467	92.4	80.8	4.26
July,	.532	.447	87.3	80.1	4.36
August,	.522	.427	86.5	80.0	16.44
September,	.713	.611	86.6	79.3	4.88
October,	.893	.789	85.6	74.7	8.15
November,	0	0	0	0	0
Deeember,	30.147	30.045	68.7	63.2	0
	Observation for 1833.				
	Inches.	Inches.	°	°	Inches.
January,	30.240	30.133	77.1	55.8	0.05
February,	.152	.035	83.0	63.6	0.48
Mareh,	.060	29.937	94.7	72.9	0
April,	29.958	.847	95.8	77.2	3.57
May,	.817	.714	91.8	79.7	12.86
June,	.767	.679	92.9	83.2	3.04
July,	.712	.633	86.5	80.9	13.04
August,	.780	.699	86.7	80.0	12.63
September,	.834	.736	88.3	80.0	8.19
October,	30.027	.929	88.2	77.2	3.68
Novcmber,	.161	30.075	85.1	66.8	0
Deeember,	.126	.039	76.9	59.6	3.02

Meteorological Register—Continued.

	Maximum. Pressure.	Minimum Pressure.	Maximum Temperature.	Minimum Temperature.	Quantity of Rain.	Moon's Parallax in Apogee.	Moon's Parallax in Perigee.
Observation for 1837.							
	Inches.	Inches.	°	°	Inches.	′ ″	′ ″
January,	31.100	30.009	80.0	0	0	53 56	61 25
February,	30.083	29.987	84.5	0	0.96	53 59	61 15
March,	29.992	.878	93.8	0	0.22	54 7	60 37
April,	.854	.760	98.7	0	0.98	54 13	59 26
May,	.781	.683	97.1	0	3.07	54 13	59 51
June,	.696	.618	98.2	80.8	5.73	54 6	60 41
July,	.620	.547	87.1	79.6	7.93	53 58	61 15
August,	.686	.607	86.8	79.2	10.12	53 55	61 21
September,	.801	.706	89.1	79.7	9.82	54 3	60 57
October,	.927	.845	87.6	75.0	4.68	54 10	60 10
November,	.995	.916	83.5	65.1	0.03	54 14	59 20
December,	30.086	30.004	79.1	55.8	0.07	54 9	59 52
Observation for 1838.							
	Inches.	Inches.	°	°	Inches.	′ ″	′ ″
January,	30.055	29.970	79.5	53.8	0	54 1	61 5
February,	.028	.926	85.6	62.1	0.12	53 56	61 25
March,	29.956	.859	92.4	71.0	0.36	53 55	61 14
April,	.823	.724	95.9	75.7	1.43	54 0	60 35
May,	.791	.694	99.2	79.5	2.13	54 10	59 43
June,	.614	.535	89.2	80.6	11.76	54 11	59 17
July,	.616	.500	87.4	79.6	10.43	54 4	59 56
August,	.661	.595	85.4	79.9	11.08	53 56	60 46
September,	.782	.703	87.7	79.1	8.16	53 52	61 19
October,	.935	.863	87.8	75.0	7.52	53 55	61 10
November,	30.000	.925	82.4	65.5	0	54 1	60 8
December,	.056	.988	80.7	60.8	0	54 8	59 18

Meteorological Register—Continued.

	Maximum Pressure.	Minimum Pressure.	Maximum Temperature.	Minimum Temperature.	Quantity of Rain.	Moon's Parallax in Apogee.	Moon's Parallax in Perigee.
	Observation for 1843.						
	Inches.	Inches.	°	°	Inches.	′ ″	′ ″
January,	29.987	29.892	78.7	61.5	1.67	54 10	60 6
February,	.885	.795	85.8	67.0	0.64	54 3	60 56
March,	.829	.750	91.2	72.1	1.20	53 55	61 22
April,	.811	.711	96.5	76.9	2.42	53 56	61 18
May,	.686	.610	93.5	79.9	5.33	54 5	60 46
June,	.554	.492	92.6	81.7	8.64	54 12	59 57
July,	.554	.495	86.7	79.9	10.18	54 14	59 29
August,	.606	.541	87.9	80.1	20.05	54 9	60 32
September,	.698	.625	87.7	80.5	11.19	54 0	61 12
October,	.915	.847	87.8	76.6	2.16	53 55	61 24
November,	.944	.861	84.0	85.8	0	53 56	61 5
December,	30.011	.923	78.8	58.3	0.86	54 5	60 20
	Observation for 1844.						
	Inches.	Inches.	°	°	Inches.	′ ″	′ ″
January,	29.996	29.907	78.8	58.3	0.22	54 12	59 27
February,	.973	.879	85.2	63.6	0.08	54 9	59 19
March,	.849	.762	94.0	72.4	0.22	54 52	60 59
April,	.713	.616	95.2	78.0	3.13	53 55	60 57
May,	.610	.524	91.7	79.3	7.44	53 53	61 20

A remarkable similarity is observable in the course of the three Calcutta Epidemics as regards the effects of season. A few fatal cases occurred in each autumn not sufficiently numerous to attract attention, but giving note of the existence of the disease, and the necessity of preparation. The first cool

days of November added great activity to the poison, and thereafter the monthly mortality is seen to progress in arithmetical ratio throughout the winter and spring. Unchecked by the returning heat of March and April, the mortality reaches its height at this time, but yields perceptibly on the occurrence of the early rains in May; and if (as was the case this year) this month prove a wet one, and the electric constitution of the atmosphere be disturbed by frequent *North Westers*, the decline of the disease is rapid, and on the establishment of the rainy season in July it may be expected to entirely disappear.

I shall have occasion hereafter to remark how exactly the same law holds in Bengal and in India generally in respect to the Vaccine disease. It is also well known to apply to Measles and Chicken Pox, the only other of the exenthemata I believe which exist in this country. These, though in a mild form, as compared with the same diseases at home, prevail very generally in spring. Hooping Cough is the Epidemic of the rainy season, Remittent Fevers that of the autumn, and Cholera is always prevalent at the change of season, but particularly at the setting in of the cold weather.

Like many others, I have sought to trace some connection between the course of the various Epidemics of Bengal and the constitution of the atmosphere at the time, in particular years, and during particular seasons of deviation. But though I believe the law of Vicarious Epidemy to be fully established, and the above sequence of diseases to be the common one in Calcutta, I do not feel warranted in deducing any definite conclusions from my own scanty obser-

vations, with regard to the special influence upon such diseases exercised by the varying Hygrometric, Electrical and Thermometric states of the atmosphere. It is however now well ascertained that the two elements of heat and moisture in the atmosphere are incompatible with the presence of any of the exenthemata in an active state in Bengal. And with reference to Vaccination the conclusions are obvious. As to the occasional sporadic cases, or even general explosions of Cholera, which occur every now and then in connection with a bad harvest, stormy weather, and a high price of rice, or some unusual but remarkable deviation from the ordinary course of the seasons, no legitimate inferences can be drawn from these.

One other observation I think I am justified in advancing, without pretending to maintain its accuracy beyond the field of my own experience, which is that the particular constitution of the atmosphere, which during the prevalence of Epidemic Small Pox in any season, determines the type and character of that disease in respect of virulence and malignancy, exercises considerable influence also upon that of the Epidemic which succeeds or replaces it.

In his account of the remarkable Epidemic Fever which prevailed in 1833-34, Mr. Twining remarks, that "the mild form of remittent Fever which occurred at Calcutta and its vicinity during the autumn 1834, exhibited but a faint type of the more violent disease which raged in this neighbourhood from the *middle of July to the end of October* 1833, the lamentable consequences of which will be long remembered by many of the survivors of this community, whose friends

were among the victims of that destructive Epidemic." A glance at the Table A. will shew that, at the time stated, the middle of July—when this well-remembered Fever invaded Calcutta,—an Epidemy of virulent Small Pox was on the decline, having fallen from 112, the number in June, to 38 in July, and to 14 in August.

My attention was not given to the subject at the time, and I am unable to say if any Epidemic, or in what particular form, disease succeeded to the Small Pox of 1838; but it is well known that towards the middle of May of *this year*, when the Small Pox was declining, Cholera made its appearance with unusual severity, marked with features of similar putrescency, such as I have seldom seen in India.

In popular language, the Cholera of this season has been talked of as "Malignant," meaning thereby that its course, though unusually fatal, was wanting in all those violent symptoms of struggle and of reaction, which, while affording field for medical tactics, offer also some hope of victory. The Cholera of May 1844 was characterized by the absence of spasms, by a passive and involuntary diarrhœa, a cold pale surface, congested countenance but without head-ache, and with perfect sensibility, a rapid small pulse, &c. Amenable to treatment, the diarrhœa readily yielded to ordinary measures, but no reaction followed. In a great majority of cases among Natives, this temporary improvement was followed by a long protracted and fatal collapse of all the vital powers, a perfect inertia and torpor, without typhoid or any other signs of febrile movement, with no appetites, and with a bare retention of life and intelligence. On the 8th of

May, I examined the body of a Mussulman horse-keeper (Seyce) who had been admitted into the Park Street Dispensary, 21 days previously, under an attack of Cholera, and had lingered on till that time in the state above described ; he was, at the time of death, reduced to a perfect skeleton ; the eyes had ulcerated, burst and collapsed a week before, the chest and extremities were denuded by vesication and sphacelus, the back was extensively ulcerated ; yet until within a few hours of death his tongue was pale, cold and moist, he responded to a loud call, and accepted the offer of food without relish or opposition. Previous to the attack, he had been in perfect health and regular at work ; the symptoms on admission were characteristic of the nature of his case, those of true "Cholera asphyxia"—and were readily checked by Ammonia and a little Brandy, with not more than 60 drops of Laudanum altogether (to the undue use of which the "congestive" character of the disease this year has been attributed,) but without the usual reaction, without any symptoms of even passive cerebral congestion, or of effusion, a state of collapse ensued which was protracted for 18 days, terminating as above described. On a careful inspection of the three cavities, and of the spine, nothing unusual was observable beyond an undue quantity of limpid serum in the ventricles, and perhaps some unfrequent degree of induration of the cerebral substance.

Cases similar to this were not uncommon, and I confess are so extraordinary to my apprehension, that I am forced to conclude that they, in common with a majority of the cases of Small Pox among the Natives

this year, derived their peculiar asthenic character from some occult and unappreciable condition of the atmosphere itself, which would appear to exercise a specific and direct influence on the animal fluids, particularly the blood, destroying the *vital affinity* (so to speak) of its elementary constituents, and causing a depraved and poisoned fluid to be circulated instead of the health-maintaining health-restoring stream, which ought to animate the organs of functional life.

I subjoin, in final illustration of the course of the late Epidemic, a Summary Table prepared from the Reports made daily by the Tannadars.

TABLE F.

Exhibiting the progress of the late Epidemic monthly among all classes of Inhabitants.

	Men.			Women.			Children.			Total.
	C.	M.	H.	C.	M.	H.	C.	M.	H.	
September,.....	1	10	9	0	5	3	1	11	8	48
October, ...	0	6	17	1	2	2	0	8	8	44
November, ...	5	12	28	1	17	21	5	15	30	134
December,.....	3	15	41	1	14	27	4	18	31	154
January, ...	14	42	59	16	44	38	18	41	43	315
February, ...	6	97	134	5	64	60	11	62	67	506
March, ...	29	118	211	38	90	149	39	125	192	991
April,.....	16	55	95	4	27	60	15	52	87	411
May, ...	5	26	39	0	14	27	2	25	42	180
Total,.....	79	381	633	66	277	387	95	357	508	2783

The results here exhibited differ not very materially from those obtained at the Ghats and Ghorustans—and tend therefore to confirm the general accuracy of both registries, and to prove the facility

with which, by a little more trouble, and with a more complete establishment, the most valuable statistical information upon any subject connected with the medical hygeine of Indian Cities might be obtained.

The discrepancy in total amounts between them may readily be accounted for, by supposing that many bodies were disposed of at the Ghats, &c. known indeed to be those of Hindoos or Musselmans, but from what part of the town or nearest suburbs not being ascertainable.

The totals are as follows for nine months :

	Christians.	Mahomedans.	Hindoos.	Total.
Tannadar's Report, ...	240	1015	1528	2783
Ghat and Ghorustans' Registry, ...	0	1118	1697	2815

Native Treatment.—The usual treatment followed by Natives is essentially "cooling" and expectant. One of the benignant Divinities of the Hindoo Pantheon, variously named Seetulah, Bowanny, &c. is specially the guardian of those affected by Small Pox, and at her shrine prayers are offered and vows made by the relatives. I possess a curious ancient gold coin, of about half an inch square, which represents the Goddess in her usual attitude, viz. seated naked upon an ass bedecked with flowers and jewels; she holds in one hand a broom, representative of the duty of cleanliness; resting on the left hip, and supported

by that arm is a large round water jar indicative of the necessity of ablution and coolness. On her head she carries a winnowing sheaf or fan to be used as a ventilator. Medals of the same description of gold or silver are very commonly worn as amulets—but I fear that the primitive duties enjoined on the worshippers of Seetula are too much neglected for the more important ones of priestcraft, incantation ceremonies, and propritiatory offerings. "For the first two or three days after the attack Mr. Blacquiere tells me they abstain from administering any thing to the patients, then (besides incantation) decoctions and ptisans of *eau sucrée*, flavored with aromatic herbs, are administered, calculated as supposed to support the strength of the patient and to thereby promote the eruption, avoiding every thing likely to check or interrupt it."

"On the appearance of the eruption, outward applications are used which mollify and cause maturation of the eruption; and when the Pocks are ripe they are punctured and the matter evacuated."

My friend, Baboo Russomoy Dutt, also writes to me on this head as follows:

"My information as to the medical treatment is not very accurate. I cannot but think however that there is hardly any medical treatment, the recovery is more relied on under the superstitious belief on the mercy of *Sietula* (the presiding Goddess over Small Pox) than on any medical treatment. A passage in the prayer usually offered to Sietula runs

"No Charms or Medicines exist for the wicked disease."

"The following I believe is the usual mode of treatment. In the first stage of five days when the patient is laboring under fever he is almost starved;

dry sweet meats or sugar candy *(Batassa)* is given only for food, and some ingredients *(Jaree* and *Pachun)* are administered as medicines. In the 2d stage after five days, when the fever goes off, food is given, milk and rice, rice and moog jurie, and milk mooky after the 11th day. On the 7th day cold water is sprinkled over the body, and on the 9th day a thin poultice made of turmeric, linseed meal, and milk is applied over the pustules. On the 12th day the diet is restricted and confined to thin *chapatee* bread, moog jurie and fried potatoes, potol and katchkala grain, and that in small quantity. This continues up to the 15th day when generally the patient is expected to recover."

Conclusions.—From all the preceding, (though imperfect) statistical information, from what I have myself seen, and from the conjoint testimony of several professional men whose observation of the disease among Natives has been ampler than my own, I believe I may briefly conclude this account by stating the following as the usual features of Small Pox in Bengal.

1st. All classes and castes of Natives, all ages and both sexes are pretty equally susceptible of infection, the mortality being mainly dependent upon the modifying circumstances of previous inoculation or vaccination, of natural constitution, of present health or feebleness, of personal comfort, or destitution affecting individuals; and by the particular constitution of the atmosphere, the salubrity of the locality, and the construction of the dwelling.

2d. The great majority of the victims are totally unprotected either by vaccination or previous Inoculation, though the latter practice is most common.

3d. Those who have undergone the disease previously either naturally or communicated by Inoculation, or who have been *successfully* vaccinated, always have the disease in a somewhat *modified* form. The incursive fever is often equally violent, but the eruptive stage is always milder, and the secondary fever proves fatal only in previously debilitated or scrofulous subjects.

4th. In those who suffered from high fever at the onset with much cerebral and nervous excitement, head-ache, delirium, and severe lumbar pain, unless early destroyed by fever, the eruptive stage succeeds most fully and favorably, affording though in a confluent form, great relief to the sufferings and promise of a favorable termination. In these cases the chief danger arises about the 12th and 14th day from the secondary fever then occasioned by the erythematous condition of the skin.

5th. The worst, and most certainly fatal cases, are those of asthenic type occurring generally in miserable, impoverished, and debilitated subjects, or in lethargic, scrofulous and obese constitutions, in which early passive hemorrhages, the result of venous congestion, occur from the mucus surfaces of the bladder and bowels, or from the uterus in women, in which the maturative process is imperfect, and petechiæ or bloody vibices soon cover the skin, death ensuing about the 8th day from anœmia, while the sensibilities are fully retained to the last moment.

6th. The violence of the Epidemic is moderated by a damp and hot atmosphere, its diffusion promoted by dry and cold weather.

Small Pox of Europeans.—Of the disease as it appeared among the *European community*, and that now very large and respectable body of inhabitants known by the designation of *East Indians*, I should be able to give but a very partial account were it not for the kind assistance of my professional brethren in Calcutta, by all of whom I have been frankly favored with valuable information regarding the cases which came under their observation and care in the course of private as well as public practice. Their most kind and ready compliance with my troublesome requisition has enabled me to embody a mass of information otherwise unattainable, and to lay before the profession a more comprehensive and complete view of this subject than could possibly have been done otherwise. Hospitals every where afford the history of but *one class* of patients, and that not by any means the most useful or important in the community; while it is equally certain that the experience and observations of a single private practitioner must of necessity be limited, often erroneous, and always questionable when unsupported by public records and contemporary authorities.

The following is a series of queries which I took the liberty of addressing on the 1st of May to the Principal Medical Practitioners in Calcutta.

Queries respecting Small Pox and Vaccination,
1*st May*, 1844.

1st. What number of cases of Small Pox among the European, or East Indian population, have come under your care during the past six months.

2d. Of these how many had been successfully vaccinated, how many had been doubtfully vacci-

nated, how many had had Small Pox previously, how many were quite unprotected?

3d. What was the general character of the disease among those who had been vaccinated?

4th. Was recent vaccination in any case followed or accompanied by varioloid eruption of serious character and what was any such case attributable to?

5th. Are you satisfied with the vaccine lymph now in use in Calcutta. Do you consider vaccination equally efficacious when practised in the hot seasons in Calcutta as in the cold weather?

6th. Have you known many (or how many) cases of successful re-vaccination?

7th. Do you think that *change of climate* and the *period of adolescence* renew in Europeans the susceptibility to Small Pox which *infantile* vaccination had destroyed pro tempore. Or *what* circumstances in your opinion wear out or destroy the protective influence of early vaccination?

8th. Have you practised vaccination in the Upper Provinces and with what success?

9th. Had you occasion lately to know certainly, or to suspect that some part of the Epidemic Small Pox was caused by the use of the meat of animals supposed to be affected with the disease called *Matthah?*

10th. Have you seen much of the Small Pox among Natives, and in what respects do you consider it differed from the disease in Europeans? Are secondary affections common and what are they?

11th. Do you know of any cases of fatal Small Pox being caused by Small Pox-inoculation? or of any case of varioloid disease traceable to contact with diseased cattle as among the milkers of Gloucester?

From most of the gentlemen addressed I have been favored with ample and satisfactory replies, the practical part of which, as connected with the Small Pox disease among Natives I have embodied in the preceding pages, and I now proceed in the words of the different writers to detail their valuable observations and remarks regarding the disease among Europeans, reserving the statements and opinions on the questionable topic of vaccination to a subsequent part of this Memoir.

Dr. H. H. Goodeve writes as follows, from the Medical College:

"It appeared to me that the purely European population of this city were peculiarly exempt from the true Small Pox during the late Epidemic. A few cases occurred, but these were chiefly in the lower classes. I neither saw myself nor have I from others heard of more than a dozen cases in the respectable portion of the community. This exemption was no doubt caused by their superior mode of living, as regards dwelling houses, cleanliness, ventilation, food, and the like, but there is no doubt it may be attributable also to the greater care taken to give full effect to the operation of vaccination in their childhood.

"The prevalent disease which came under my observation began with a smart attack of fever, generally accompanied by cerebral irritation, requiring the employment of leeches and ice to the head, active catharties, tartar emetic, &c. On the fourth or fifth day an eruption, more or less extensive, shewed itself. This resembled Chicken Pox far more than variola, but it differed from the former in the number

of vesicles, in their appearing principally on the hands and face rather than on the body, (which is I believe the usual seat of varicella) in the pustular character of some of the spots, and in the extreme severity of the antecedent fever. The febrile symptoms were no doubt encreased in severity by the climate and the extreme heat of the season. Every one of the patients I saw had had either Cow Pox or Small Pox at a former period of their lives. The disease in all terminated favorably at the end of a week or ten days. I could not in any case distinctly trace the source of infection, nor did I observe a single instance where the patients communicated the disease in any form to those around them. I considered this disease to be *modified Small Pox* so well described by the late Dr. John Thompson of Edinburgh.

"The cases of pure Small Pox, which have come under my observation, were severe but rarely fatal, except in Natives, in whom the disease was generally confluent and destroyed the patient from the 8th to the 12th day ; very few indeed of the latter recovered. The immediate cause of death was in most of these cases exhaustion of the nervous system from the extreme irritation of the eruption. Visceral disease did not appear to be common in any class of patients.

"In two cases which I saw, one of them a European gentleman, the other an American Negro, the eruption failed to develope itself thoroughly. The pustules remained flat and dark colored. The Negro after three or four days fever had no very urgent symptoms of any kind, and sunk quietly an hour or two after having expressed himself to be quite well.

"The European was a gentleman of very superior acquirements and studious habits, of spare frame and delicate complexion and exceedingly abstemious, the eruption appeared on Saturday, and he died on the Wednesday night following. The antecedent fever was very slight and the case one of peculiar malignancy. On Sunday petechiæ appeared in the extremities, mingling with the Small Pox pustules and gradually extending to the whole body, some of them as large as a finger nail, but the generality resembling musquito bites in size and appearance. The pustules themselves, as before remarked, remained *flat and imperfect*, many of them were evidently filled with blood instead of serum. On Monday the patient began to pass large quantities of blood in his urine and by stool, and blood flowed from the gums and fauces ; these appearances continuing to the hour of his death. On Tuesday night he became delirious, grew comatose on the ensuing day, and expired on Wednesday evening; there was a great deal of fever coincident with these symptoms; the tongue was black and dry, pulse rapid and full, but exceedingly compressible. The body was not examined. I have no doubt that the malignant symptoms in this melancholy case were produced in a great measure by the unusual abstinence of a religious fast (Lent), to which the patient had submitted for some weeks previously, at the same time that he relaxed not in his customary severe exertions of body and mind.

In several of the cases of Small Pox which I had an opportunity of seeing, before the disease manifested itself, the patient complained of an acute pain in the lumbar region, continuing for several days, and so

severe, as to be mistaken in more than one instance for Lumbago and treated accordingly.

" With respect to treatment I have nothing particular to communicate. I did not bleed a single case from a vein, but most of the *varioloid* patients were freely leeched and purged during the preliminary fever; in one or two of those, which subsequently proved to be Small Pox, and ultimately recovered; similar treatment was pursued before the true disease was recognized. The Native cases I did not see till the eruption was fairly apparent, perhaps they would have terminated more favorably had a modified antiplogistic treatment been resorted to in the first instance."

Replying to my special queries Dr. Goodeve states, 1st—He has " attended of pure Small Pox not more than 4; of a modified disease, resembling somewhat Chicken Pox about 20." To Query 2d—"*All* declared that they had been previously either vaccinated or had the Small Pox, chiefly the former, and most of these cases had good well-defined marks of vaccination on their arms." Of the general character of the disease in those vaccinated, Query 3d, he says, " It began with severe fever, attended by considerable degree of cerebral excitement; in most cases an eruption appeared on or about the 4th day, principally on the face and extremities. This eruption was in the most part vesicular, but there was generally a portion of pustules mingling with the vesicles, the former occasionally but rarely presenting the true character of Small Pox pustules. The eruption began to dry up and disappear on the 7th or 8th day." Replying to Query 10th, Dr. Goodeve states, " I have seen about a dozen cases among Natives this

year. In them the disease was usually confluent, necessarily severe and generally fatal; while the reverse was the case among Europeans. I have seen no secondary affections beyond one or two of sore eyes and slight pulmonary affections." Reply to Query 11, "none have come under my actual observation, though I have heard of one or two authentic instances."

From the General Hospital Dr. Jackson writes as follows—

"During the past season I have seen a greater variety of Small Pox that I have ever seen before, and have had under my care cases of the most simple and the most virulent character. I have seen also a case where the patient died after she had been vaccinated and where the cicatrix on both arms was most distinct. Of the petechial variety of Small Pox I saw two, both amongst Natives, one of them attached to the Military class at the Medical College. In this case after smart fever of the usual duration, the pustules shewed themselves on the face, the chest, body and extremities, but were irregular in their shape, some oblong, or angular, with flattened surface, very slightly depressed, and were filled with blood instead of serum. The tongue and fauces had no pustules on their mucous surface but exhaled a bloody secretion, and the same was coughed up from the lungs; the patient voided bloody urine, was perfectly rational up to the last two hours, and died from anœmia on the 6th day. This youth had not been vaccinated. The whole body of this person presented the appearance of a man in the state of maculated typhus fever.

"Of this same variety of Petechial Small Pox, though less distinct, I saw another case of a Native who had symptoms of hemoptysis and bloody urine at the commencement of his disorder. There were febrile symptoms but not more severe than usual, and he did not complain much of pain in the loins. He had not been vaccinated. Of the malignant form, in which the pustules never rose, I have witnessed two cases, both of them in persons of colour, one a Native of this country, the other an Armenian, Coachman to a Gentleman in this place. This latter person was taken with all the symptoms of fever, great constitutional disturbance, intense agonizing pain in the loins, &c. He was sent into Hospital complaining chiefly of his pain in the loins which prevented his lying in any single position, and he writhed about from side to side in the greatest agony; he had a warm bath with some leeches over the epigastrium, which was very tense, and some aperient medicine; from the character of the pulse, which was above 125, I suspected he was about to have Small Pox, he derived no relief from the bath or from the action of the bowels, the pulse increased in frequency. He then had some opiates given him every two hours. He was admitted in the evening, and the following morning when the light was thrown on the body a number of depressed spots were observed throughout the body similar to the Small Pox. The prognosis of the case was unfavorable, the intellect of the man was unimpaired, and in the Evening visit after the repeated dose of the opiate he expressed himself as greatly better and that he should soon be well. The rapidity however of the pulse which was too quick to

be counted and a chilliness of the fingers bespoke a speedy termination, and he died an hour after the visit, about 24 hours after admission into Hospital. The poisoned state of the blood in this case was shewn by the oozing of the leech bites and the great difficulty in stopping the bleeding, although he was a remarkably stout and active person, always accustomed to the best food and clothing, and living in a healthy locality.

" The other case of malignant Small Pox was that of a Native, who was brought into the Hospital after having had fever for some days, and the Small Pox marks were so indistinct, that for the first few hours it was scarcely considered to be a case of that disease. The patient died on the 2d day.

" Of the confluent kind, when the patient had been vaccinated at the age of 7, I have seen one marked case. The cicatrices were both distinct, and she had been vaccinated in this country. The fever was ushered in with the most violent pain in the loins like labor pains, unable to obtain rest or relief: On the 4th day the eruption shewed itself on the face and then over the rest of the body, and although the pulse indicated a state of great excitement, she went on well till the 8th day when the pustulus became depressed and flattened, some of them completely emptied of their contents, leaving nothing but the epidermis. On the 9th day small violet-colored patches shewed themselves on the legs and a few on the face ; these deepened in colour, and on the day of her death the face presented the appearance of ink having been sprinkled over it. The powers of life gradually gave way, and she died on the morning of

the 12th day; I forgot to mention that this young woman had menorhagia the 3d day of the fever.

"Another case of Confluent Small Pox in a child who had been vaccinated was very severe, with strong head symptoms, which yielded however to medicine, and the child recovered. There were several children in the same family, who were all exposed to the contagion and none took the disease.

"From what I have seen during the past season, it appears to me that the cicatrix itself is no sufficient proof of the Vaccine having been effectual in preventing an attack of Small Pox. In four cases that I have seen, when the cicatrix was very distinctly marked, the patients afterwards had Small Pox, and one of them died. The Natives inform me that cases during the past severe Epidemic have occurred of Small Pox taking place when inoculation had been performed.

"I believe that some cases have been reputed to have arisen shortly after the patient had been vaccinated, and that this has been attributed to the Lymph having been bad, or the child from whom it was taken being affected with the disease. I have not seen any thing of the kind, but I am most ready to give my testimony to the general good character of the Cow Pock vesicle which is supplied from your Establishment, and I have had many opportunities of observing during the past year the arcola as distinct, and the rounded pearly vesicle as well defined and marked as in the best cases of Vaccine in England. In this respect I consider the Vaccine now supplied to be superior to that obtained some few years ago. I have seen several cases when the Small Pox has been

very slight, where the face has been covered with a spurious kind of Small Pox when the constitution has been unaffected, attributable I consider to the disease having been modified by previous vaccination. Unless the Vacine did possess the prophylactic power against Small Pox, we should, during the past Epidemic, have seen more numerous instances of whole families being affected when there are several of the same age or so, instead of a single individual. The usual test of the cicatrix is evidently incorrect. Whether there is any test beyond that of inoculation (which in England is now prohibited by Act of Parliament), I know not, but I look upon what has occurred this year as exception to the common rule, and I do not consider vaccination in disrepute, because a few cases have occurred where failures have taken place. It is the mildest form of using any prophylactic against Small Pox, and from the great number who have escaped by using this simple remedy, its protective power has been very well shewn. Whether discredit has been cast on it from omission or carelessness in making the 8th day reports, is what I am not prepared to say : the largeness of the cicatrix is what I had heretofore attended to, and this during the past season has failed."

The above letter, as well as Dr. Goodeve's, were written previous to the receipt by these gentlemen of my "Circular Queries," I cannot deny myself the pleasure of adding Dr. Jackson's replies to these though involving some slight repetition of facts. Query 1—"I have seen 10 Europeans, 1 East Indian, 1 West Indian, 8 Natives, suffering from Small Pox during the last six months, total 20." Query

2—The Europeans had all been vaccinated with good cicatrices on their arm. The East Indian had also been vaccinated, but the Natives had neither been vaccinated nor inoculated; none had had the Small Pox previously." Query 3—Of the 10 Europeans who had been vaccinated one died, was vaccinated in this country at the age of 7, and had the cicatrices very well marked. She was 21 years old; two had the disease modified; seven had the disease well marked but of the distinct kind. The East Indian who had been marked had the confluent form severely." Query 10—"I have seen eight cases of the disease amongst Natives, but do not consider that it differs from the Europeans either in the character, progress or secondary affections."

Dr. R. M. M. Thomson, Marine Surgeon, writes—"I am sorry that I took no notes of the Small Pox cases which came under my view, but I remarked that in all the cases except one (Mrs. M.) who died 14th January, and would take neither food nor medicine, the vaccine scar was quite distinct. As soon as I discovered that the mother had Small Pox, I vaccinated the infant and the vesicle rose well, but on the 10th January the child became feverish and four days afterwards the *Small Pox* eruption made its appearance and ran its course mildly.

"In the Parental Academic Institution the following cases occurred. Frederick McKoy taken ill on the 13th January, and died on 26th; this was a case of Confluent Small Pox of the very worst description. The lad was apparently much better the day before he died, but was found dead next morning in consequence I fear from the Native Doctor having neglected

to give him sufficient wine and beer during the afternoon and night.

Frederick Rymer taken ill on 2d February.
J. Atkinson,..... ditto.
P. Palmer, ... ditto.
C. B. Taylor, ... ditto.

Rymer's and Taylor's cases were mild, the other two were of the most aggravated confluent character.

" In the Free School there have been eleven cases of Small Pox—five confluent and six mild,—all these have done well.

They took place as follows :

24th	January, ...	1
15th	February, ...	1
16th	ditto, ...	3
17th	ditto, ...	1
21st	ditto, ...	1
27th	ditto, ...	2
29th	ditto, ...	2

During the same period twenty-eight cases of Measles occurred, many of them very severe.

" In my private practice since the 10th of January, I have met with twelve cases of Small Pox, seven confluent and five mild, they have all recovered except one, who is now under treatment, and dangerously ill. No cases have occurred in the European or Orphan Asylum, nor in the High School."

Mr. Rankin writes from the General Hospital on the 29th of April—

" 1st.—Number of cases admitted in the East Ward of the General Hospital under my charge—

Of European-birth,..... 3
Of Eurasian-birth,..... 4
African, ... 1
— 8

2d.—" Vaccination said to have been performed in all, but one during infancy, but the evidence satisfactory in only six out of the eight cases."

3d.—" Your third question will be answered by giving the age of each patient. 1st—The African, aged 52, his own assertion that vaccination was twice performed in England, date not ascertainable; disease confluent, termination fatal.

Case 2d, age 19, distinct but severe, Recovered.
„ 3d, „ 13, ditto .... slight, ditto.
„ 4th, „ 17, ditto ..... ditto, ditto.
„ 5th, „ 4, petichial..... Fatal 20 hours after admission.
„ 6th, „ 15, distinct, ... Recovered.
„ 7th, „ 24, confluent,..... Recovering.
„ 8th, „ 21, ditto,..... Fatal."

Mr. Chapman, Presidency Surgeon, replies to my queries—

" I have seen three or four cases of the modified disease in Europeans; all had been vaccinated as supposed. One I believe had Small Pox previously. The general character of the disease was that of severe febrile symptoms; at first the eruption appearing on the 3d or 4th day, shape irregular and vesicular. Some few of the pocks, however, presenting the appearance of genuine variola, febrile symptoms subsiding immediately after the appearance of the eruption; no secondary fever."

Mr. Raleigh, from the Native General Hospital, writes in reply to my queries, that " he has only met with three cases of true Small Pox among Europeans this season. They had been vaccinated when young,

two were adult females, the 3d a girl of 9 years of age. The two adults had Confluent Small Pox, with early malignant symptoms, such as petechiœ and hemorrhagic discharges, but recovered; the girl died. I have this season seen several cases of fever attended by an eruption like Measles, or a rash immediately following vaccination, and one case of Small Pox exhibited its primary symptoms on the 2d or 3d day after vaccination, but whether dependant on the virus introduced into the arm as vaccine or not, is I think, questionable."

Dr. Finch, Presidency Surgeon, reports that "one stout European patient, age 22 years, and another East Indian, had both been vaccinated in infancy and had distinct marks on their arms. In the former the disease was severe, the eruptive fever attended with delirium and vomiting, the Pocks confluent on the face and numerous on other parts of the body. In the second the disease was mild, the pustules small and but few over the whole body, but they were depressed in the centre, which characterizes the true varioloid eruptions."

Dr. Finch further states that he "has seen much of Small Pox among Natives in the Provinces, but can detect no dissimilarity in disease affecting either the Asiatic or European."

Mr. Maxton, Police Surgeon, "has had about twenty-four cases of Small Pox this season in his private practice, and about forty Native cases, the latter principally in the Police Hospital and the Small Pox Hospital lately attached to it." "Symptoms and appearances similar,—only the Pock (in the Native) did not appear to me so well developed but rather flaccid. In

many of these cases diarrhœa and cough appeared after convalescence. In others foul ulcers about the back and lower extremities, and full of worms." "Many of these (Natives) said they were inoculated." Of the Europeans "three or four were vaccinated by me successfully some years ago. As regards the others they were mostly adults and could not give any authentic statement of having been vaccinated in early life. None were aware of having had the Small Pox before"—"all the cases were *distinct*, with one exception, which was mostly confluent over the body. On the extremities where some of the Pocks were distinct, the size was enormous, more like a large sac of pus than a Pock."

Mr. Allan Webb, Assistant Garrison Surgeon, states that he has "seen fourteen cases among Europeans," but does not say whether they were within the Garrison of Fort William or in the Conductor's Barracks out side of the Fort, or in the Lower Orphan School. "All had been vaccinated—all marked—marks imperfect in most—none had the disease before—all unprotected, in as much as they all had it."

"Character generally mild ; one died of apoplexy, (a child of 12) one died of (putrescency) dissolved state of the blood, having petechiœ instead of pustules." Of the disease among Natives, he says "no difference have I observed, excepting that they have it much worse, for they will not let fresh air come around them."

Mr. Webb writes subsequently—"Soon after the Small Pox broke out at Allipore, it reached the neighbourhood of the Military Orphan Schools, of which I have charge.

" The deaths all around became fearfully common, especially cows were dying in great numbers. Mr. Lancaster, the Head Master, reported this to me, and upon this report I obtained an order to confine the children within the School, and also to prohibit the admission of beef as diet during the Epidemic; indeed during the hot season to confine them to a vegetable diet only.

" I was very much afraid of the milk sold at this time, for *I knew* that the sellers of milk suffered much from Small Pox.

"I was led to adopt this plan because there appeared to me abundant evidence to shew that the disease in cows does, under certain circumstances, produce genuine Small Pox. (See Dr. Rutter of Bavaria, Dr. Mahey, and Dr. Gasnei's statements,) moreover I observed among the Natives of Bengal in 1837, that though all the first cases were varicella it merged during the hot weather into variola. The same was the case in the Military Orphan Schools, the first cases being varicella (no central depression,) the last all true variola. Vaccinia (or the cow disease) varicella, and variola may, I think, be converted into each other.

" Another reason which determined me to exclude beef was the very bad quality of the meat which was sold in the bazar at this time.

" Twice I rejected it in the Fort; the Soldiers complained of its appearance; the beef was flabby, watery (anasarcous) with red absorbent glands in some meat, which was sold for the table of private families; I cut open some of these glands and found them *suppurated.*

"I was so convinced of the bad nature of the meat sold at the time in the bazar, that I daily visited the

bazar myself to purchase meat for my own table, and would allow none other in my house. During this time no beef whatever was brought.

" To return to the Military Orphan School; I have reason to think the disease was introduced from the Baker to the Establishment. One of his Assistants died of the Small Pox.

" It may be as well to say one word about the treatment, for *one word* will suffice, namely, *bleeding*. There was no other treatment whatever. In one case a little girl, the delirium was so violent, I was obliged to bleed from her arm to fainting. The other cases merely required leeching. I had a good deal of experience in England. I found all purgatives served to throw the disease on the mucus surface of the bowels. All antimonials were likely to do as much for the respiratory mucus surface. Neither there nor among those patients at the Lower Orphan School, nor in the Fort, have any become marked."

Mr. Richard O'Shaughnessy writes to me as follows, 6th June:

" Although the daily average number of patients attending the *Gurrunhattah Dispensary* is upwards of 200, yet not a single case of Small Pox presented itself at that Institution during the whole of the late Epidemic, either before or during the eruptive stage of the disease. A few cases of destruction of the cornea, and disease of the joints, the sequelæ of Small Pox, were brought to the Dispensary, but the number was comparatively very trifling. In one case the whole of the ligaments of the large joints appeared to be completely destroyed. The patient, a child about 8 years of age, was deeply marked all over the body

with the Small Pox, which evidently had been of the confluent form. The Small Pox Hospital attached to the Gurrunhattah Dispensary, (like all other temporary Institutions established by Government at the same time) completely failed to realize the object for which it was instituted, owing to the obstinacy and prejudice of the Natives—only four or five cases were received into the Hospital, and they were all of the worst form of the disease, and the patients, either male or female, of the lowest caste. In two patients venereal chancres existed on the generative organs at the time they were attacked with the variolous disease.

"The first case of Small Pox I saw in private practice was a young East Indian, a girl aged 10 years; she had been successfully vaccinated when a year old. In this case the primary fever was very severe, and lasted fully seven days before the appearance of the eruption, which came out in the mildest possible form, the pustules were very thinly scattered over the limbs and face, and so small and free from surrounding inflammation, that but for the central depression I should not have recognized the nature of the disease.

"In the same house an European young man, aged 28, was attacked a few days after the appearance of the eruption in the girl. The primary fever lasted the usual time, about eight and forty hours before the appearance of the eruption. In this case the eruption was very severe but distinct, he had been vaccinated successfully in England when a child.

"Contrasting the above two cases. In the girl of 10 years of age, the protective influence of the

vaecine virus appeared to be still fresh and effective, but in the man 28 years, it on the eontrary, seemed to be partialy worn out if not completely destroyed.

" I also attended a family, three of whom had been attacked the same night and almost at the same hour. The Small Pox was raging in a neighbouring bustee. This family eonsisted of a father (Mr. B.) and six children. They had all been vaecinated when young, and the father had had the Small Pox. The three eldest of the family were those attacked,—two young women and a lad about 19 years of age; the others were all below 14, but though living in the same house and exposed to the same sources of contagion as their sisters and brothers, they eseaped the disease. In the young man and the eldest sister the attaek was mild and the disease deeidedly modified, but in the 2d sister who was married and six months gone with ehild abortion took plaee on the 2d day—on the 4th day the body beeame eovered over with livid blotches and large vesieles sueh as rise over a sphasilated part. The whole mouth and throat became eovered with uleers, and she died on the 6th day retaining her intelleet to the last

" The only eases in whieh I attempted re-vaeeination were in the wife of the young man first mentioned in whom it suceeeded perfeetly, she had two large and beautifully marked vaeeine pustules on each arm; at this time she was attending her husband. The other ease was one of Mr. B.'s three younger ehildren in whom it failed completely."

Dr. McPherson of Howrah, replies to Query 1.

"I have seen upwards of a dozen eases here, but I cannot say anything on them, or the two next heads

with sufficient accuracy to make what I might say of any use." To Query 4 he says—"In two or three cases both in Howrah and in the Upper Provinces, I have seen recent vaccination followed by varioloid eruptions, but never of a serious character. I could never assign any satisfactory cause for these exceptions." To Query 10th, "according to my experience I should say as a matter of fact, that both in Cawnpore and here the disease ran very much the same course in the vaccinated European and unvaccinated Native. I have seen diseases of bones of the joints, as well as destruction of the eyes follow as sequelæ." Reply to Query 12—"not as far as I know. As connected with a previous question I may state my own case. I was vaccinated when an infant by my father, a medical man, who used to vaccinate to a considerable extent. I was vaccinated successfully and at the age of 8 got what Dr. John Thomson, who saw me, called modified Small Pox. All the family had it and one of my brothers was dangerously ill. When 21 years old I had one or two small pits in my face, and when attending on a Hospital patient got the regular disease but in a mild form. The brother who was so seriously ill on the first occasion, was with me constantly during the latter attack but had no return of the disease."

The leading features of the disease among Europeans and Anglo Indians, have been so ably and fully given in the above documents, that, but for one or two observations which I wish to make it would be unnecessary to add the results of my personal experience, though it has been very considerable during the last six months in schools, and in families of the

middling class, as well as among Natives. Of Europeans I have this season seen 28 cases, whereof seven had never been vaccinated, and of these latter one died. In all the former though the disease was more or less severe it was in *some marked degree* modified. The patients were mostly children at School, and two were at my recommendation transferred early to the General Hospital by their guardians, where a separate ward and a special nurse, &c., were allotted them by Mr. Nicolson, and the spread of the disease in the Schools where they were was thus prevented. One patient was a French Lady from the Upper Provinces who was nursing an infant of three months. She contracted the disease in a confluent form and could not say positively whether or not she had ever been vaccinated; her infant happily was saved from infection by timely vaccination, but an elder child of 3 years, who had been vaccinated in the Mauritius had modified Small Pox.

The following history of the disease as it occurred in one family, whom I attended in January, presents several points of interest and is thus deserving notice. On the 10th of January, I was called to see a young man belonging to the Custom Establishment, residing in Jaun Bazar, who was said to be ill with fever: I found him to be an East Indian youth of 17 years of age; he was one (the second) of a family, consisting of four boys and one girl, the youngest aged 5 years. The father was about 50 years of age, an East Indian by birth; he had been vaccinated, he said when a child in the Free School by the late Dr. Shoolbred, in 1804, without success, the operation was repeated in 1805, and for three successive years every spring, but

with constant failure. After leaving the School he submitted himself to a Native practitioner to be inoculated for Small Pox, but this attempt also failed and he has since then been frequently and freely exposed to the infection of Small Pox in every form without receiving it. He seemed however to be in a fair way of having it *now*, for a more favorable hot bed of infection could not be conceived than his dwelling house. The whole family above enumerated lived in a small wretched domicile in the middle of a crowded Native Bazar; the house consisted of a narrow hall and verandah, with two small bed rooms, and crowded into this space, besides themselves, were several Native servants of both sexes—one or two naked sprawling Bengalee children—a goat or two with kids and some poultry. Between the house and the street was a paved Court surrounded by a high wall the better to exclude any possible breath of air, and within this enclosure were the offices, kitchen, and stables, also a deep and dirty well.

By a perversity of reasoning truly national, the man obstinately refused to have any of his children vaccinated, though the Small Pox was raging around him, and was now as I told him in his own house. He was quite satisfied, he said, that vaccination was useless, and that his children inherited the same immunity with himself from Small Pox.

On the morning of 10th January, the patient was laboring under high fever with delirium, he had been ailing for some days; but became very ill on the 9th, and his fever had been increasing until now. Before evening the face, neck, and arms were thickly studded with small pink spots, which the father insisted

were merely small musquitoe bites, and which in fact they very much resembled. During the 11th, 12th, and 13th, a good many of these maculæ advanced, but others remained stationary or only becoming darker in tint, depressed and flattened. The fever gradually assumed a low typhoid character, the tongue and lips became coated with hard brown dry sordes, the urine and alvine evacuations were hemorrhagic and very offensive; the face at length became a swollen mass of ulceration, in which none of the features were distinguishable, the back and hips sloughed, the legs were flayed by vesications, he remained in a nearly comatose state for several days and expired on the 25th January, the 16th day of illness.

During the progress of this frightful case, I had exerted all my influence with the parent either to procure the separation of the patient from the family, or of the family from the patient, but in vain. The poor lad was assiduously and affectionately tended by each and all.

It was not until the 21st January, when the scene was evidently drawing to a close, that I prevailed on the father to allow the other children to be vaccinated.

The eldest son a lad of 21 chose, however, to keep out of the way; the three younger children were vaccinated on the 21st January. After the death of the patient on the 25th, I also succeeded in prevailing on the family to remove to another residence, and this was done on the 1st of February to a clean newly painted small tenement in a different part of the town. That same evening the eldest son (unvaccinated) was seized with rigor succeeded by smart fever, headache,

delirium. On the 4th of February, he was profusely covered with papulæ; on the 11th, these had progressed favorably into full, regular and lymphoid circular vesicles which on the face were confluent. From this time the febrile symptoms moderated, I did not interfere with his treatment, which was put into the hands of a Native "Cubbee-raj," (Doctor,) but I understood that he was removed soon after, and I heard no more of him for six weeks when he waited on me for a *certificate of his having been ill;* he had lost his hair and eye-brows, and was deeply marked all over the face.

The history of the three children who were vaccinated on the 21st was more interesting. The eldest, was a boy aged 10 years. On the 22d, the day immediately succeeding vaccination, he had a shivering fit succeeded by smart fever; on the 23d a papular eruption was definite on the face and arms, and it became general on the 24th and 25th.

Slight inflammation of an erythematous character arose round the punctures the day after the operation, which declined, however, on the 2d day, but a specific vaccine pock appeared with normal character on the 3d day. From this time the vaccine disease progressed *pari passu* with the Small Pox eruption steadily and regularly, presenting on the 7th day full and pellucid circular umbilicated vesicles with large well defined areolæ not less in diameter then a half-penny. Within the circle on each arm might be seen several perfectly distinct Small Pox pustules which advanced to desiccation more slowly, leaving more persistent scabs than those of the vaccine, and finally the usual cicatrices. The varioloid

eruption was free and distinct. The disease was certainly undergone very mildly, but how far this was attributable to the vaccination or otherwise, I pretend not to say. On the 30th January, when both diseases were about their height, secondary fever set in with much violence and increased to an alarming degree for three or four days. There was at first violent headache and lumbar pain, then constant restless jactitation, yawning or retching, burning headache, &c., indicative of incipient cerebral mischief. These symptoms were soon followed by delirium, strangury, subsultus of the muscles of one side of the face and eye-lids ; I feared but too surely that effusion had taken place on the brain. To my surprise no less than my pleasure, these symptoms disappeared suddenly on the 2d of February, after voiding one living and two dead lumbrici, and the child recovered rapidly afterwards.

Another, the 4th boy, aged 8 years, went through the vaccine well and regularly, but *as it was subsiding* a modified eruption of Small Pox very partial and trifling made its appearance, which did not confine him at all and dried off in less than a week leaving no marks.

The 5th child, a girl of 5 years, had a healthy and regular vaccine disease and no other symptoms.

The exact period of "incubation," or the "latent period," is still I believe a doubtful matter, but I confess that until now, I did not believe it possible that two *allied* though so perfectly *distinct* diseases could co-exist at the same time in the same individual.

In the practice of the late Mr. Ledlie, I saw in February, another precisely similar case of perfect Small

Pox pustules in immediate close conjunction with good vaccine vesicles. Other similar cases are quoted by Dr. G. Gregory, in his volume of admirable lectures on exanthematous diseases lately published.

The facts, however, above narrated should arm all practitioners with a strong argument against those who are disposed to undervalue vaccination; since there can be no doubt that the two diseases may and do exert a powerfully modifying influence upon each other, and that the actual appearance of one or other in suspected cases, depends upon the priority of *reception* by the constitution of one or of the other poison. I incline to think some of those untoward accidents, (to one of which Mr. Raleigh alludes in his notes,) may be easily accounted for by supposing that though the vaccine subject from whom lymph is taken presents at the time of taking it a fair enough vaccine pock on its arm, the poison of Small Pox may be latent either in its constitution or in that of the subject to be vaccinated and may develope itself perhaps the very following day.

In the imaginary case of exactly equal and contemporaneous exposure to both infections if I understand Dr. Gregory aright, (to whose authority on such a point I am disposed to give the fullest weight,) the more potent or virulent poison, viz., Small Pox, will very probably supercede the other in the inoculated subject, and true Small Pox will appear instead of and without vaccinia at all.

The violence of the cerebral symptoms in the case of the boy just narrated, was very remarkable. It was distinctly referrible to the presence of worms in the bowels, which in delicate and unhealthy children,

I have frequently known to produce all the symptoms of Cholera, of Epilepsy, and even of Arachnites.

One other case, the only one in which I had an opportunity of making a post mortem examination, may be usefully narrated. It occurred in the practice of Dr. R. M. M. Thomson, who was pleased to associate me in the management of it from an early stage. The patient was a young man, 21 years of age, an East Indian, residing in a large and airy three storied house in Camac Street, of full and plethoric habit of body. He was just recovering from Hooping Cough, but had always enjoyed perfect health previously. During the first week of May, he had been a daily and frequent visitor of his cousins, several of whom were ill of Small Pox, and indeed died of it under very distressing circumstances. On Saturday the 11th May, on returning home he felt sick and vomited, became drowsy and feverish, passed a restless night, and next morning had high fever with headache and general pains. For these Dr. Thomson applied leeches, and administered an active purgative of Calomel and Jalap. On Monday morning, symptoms of a malignant petechial eruption shewed themselves on the forehead, mistaken however by the unwilling bystanders for musquitoe bites. In the evening we found him with a dry warm skin, a rapid pulse, but a moist pale tongue, he was now quite free from headache and making no complaint; a few minute livid maculæ were scattered over the face and neck, but at the bends of the arms, the hams, and groins, and over the wrists there were large corymbose patches of diffuse erythema of a dingy red colour presenting within their boundaries numerous slight-

ly elevated rough papulœ of a deeper tint. During the night he passed four or five fluid black motions consisting almost entirely of grumous blood. For four succeeding days this hemorrhagic discharge from the bowels continued very free without pain or tenesmus, mixed occasionally with healthy soft fœculent matters brought down by gentle aperients. The urine, saliva, &c., were natural, the tongue continued moist and pale, there was no headache nor any complaint of pain, except from fits of coughing. Meanwhile the eruption extended gradually and slowly over the abdomen and chest, then over the thighs and extremities; it was most partial on the face and neck. It retained still the corymbose form but the papulæ did not advance to vesiculation. Round each central depressed spot, a circular slight elevation of cuticle arose but containing no fluid. As early as Friday the 5th day, these immature vesicles had very generally subsided and dried into rings of grey cuticle. The central points had now sunk deep into the corion, appearing like a shower of Ink stains upon a grey Turkey carpet. The concurrence (I cannot say confluence,) of these dry cuticular scales gave to these patches an ash colored powdery surface, beneath which, (when this was brushed off,) and round the circumference of each separate patch, the dark red glossy skin shone out in frightful contrast. Nevertheless, the constitutional disturbance was so small, notwithstanding the alarming continuance of the melœna, and this gangrenous state of the skin as to surprize us; the intellect was perfectly clear, the spirits even cheerful, the tongue continued moist, somewhat redder than before, the pulse very rapid

but full and free, and rest was procurable without difficulty by opiates.

The hemorrhagic discharge from the bowels being at first viewed as the result of some natural effort for the relief of internal congestion in so plethoric and gross a habit, and conducive to the free elimination of the morbid poison, we had hitherto abstained from any attempt to arrest it too suddenly. The patient had been allowed to drink freely of a weak solution of Hydrochloric Acid with sugar, and took saline powders containing the chlorate and nitrate of potass, in infusion of cherayta, &c. every four hours, with the view of correcting the putrescency of the fluids generally. He was also allowed a quart of beer and chicken broth, thickened with arrow-root, for diet.

On the occurrence however of secondary febrile symptoms on the 8th day, opium was given more freely—Alum-whey was substituted for the Acid beverage, and alum and laudanum injections were administered. The skin was fomented, and anointed with *liniment calcis*. By these means the hemorrhagic discharges from the bowels were effectually moderated; on Sunday a dose of Castor Oil brought away several perfectly healthy stools and seemed to give general relief. On Monday, 20th May, an unfavorable change took place, the tongue became dry and brown, the fauces raw and ulcerated, the urine red and scanty; extensive vesication of the extremities and chest occurred, and beneath the denuded parts the skin in many places presented a dark sphacelated appearance.

Quinine, wine, and other diffusible stimulants were given. Opium was chiefly relied on, emollient poul-

tices, &c. were applied to the surface. The patient however showed no signs of improvement, but lingered on till Thursday the 23d of May (the 12th day of eruption,) when he expired, having continued perfectly sensible to the last, and seated in an easy chair, to which he had begged to be moved half an hour before death.

On examination of the body 12 hours after death, the fauces and pharynx were found to be extensively ulcerated, the larynx was denuded of its mucus membrane, or at least this could not be distingushed from the pulpy purulent offensive mass which lined its whole inner surface; the lungs were healthy though congested and containing a serous milky fluid on the right side: The general aspect of the abdominal contents was pale, the mucus surface of the ilium presented the not uncommon appearance, of inflamed, and thickened follicular corrugations, the intervening villous membrane being however pale and healthy; no ulcers could be discovered.

The colon, which was thin and much distended with air, and apparently on the eve of gangrene, presented an uniform slate colour externally; throughout its whole extent internally from the caput cœcum to the segmoid flexure, it was studded with small conical ulcers, standing out from a healthy base in distinct irregular eminences, like small nipples—the apices crowned either with a pustule or with a small round hollow ulcer holding a loose coagulum of blood.

These appearances in no way resembled the common ulcers of tropical acute Dysentery, which are generally of irregular shape, differing from each other in size and extent, with, in many cases, elevated edges

certainly, but this caused by interstitial thickening of the whole intervening coats of the bowel, while the ulcers themselves present smooth white apthous, or clean raw surfaces with a few red granulations; equally unlike were they to that form of phagedenic ulceration of the mucus membrane, observed in some forms of tropical diarrhœa (lately common in invalids from China,) having large abraded surfaces, with thin ill-defined ragged edges, in attenuated transparent bowels, with indurated mesenteric glands.

The worst feature of the case remains to be mentioned; the unfortunate youth had been vaccinated in infancy by Dr. Halliday, (formerly a Presidency Surgeon of this City,) who was so well satisfied with the appearance of the *Pock*, that he carried the child with its Nurse in his carriage to supply lymph to one or two families.

I will not venture to speculate upon the appearances in this single case, but regret very much that, owing to other serious avocations, the state of the weather, and the very unpleasant nature of the task, my investigations into the pathology of the disease extended no further. Even in this painfully interesting case it was the joint opinion of Dr. Thomson and myself, that the modifying influence of vaccination was perceptible in the early part of the case.

PART II.

THE DISEASE AMONG COWS.

It has been generally believed that the disease, called "Matta," prevails every spring among horned Cattle in Bengal. I can positively declare that it does not do so in, or within 20 miles of Calcutta.

For the past 15 years, I have never failed to inquire for its existence, I have offered rewards and even paid as much as 20 Rupees in advance to different swindlers merely to bring me to the sight of one case, but invariably was disappointed. Equally difficult and impossible was it till now to get sight of a case of Small Pox.

The truth is, that a number of diseases affecting cattle are classed under the same name, and the only distinction made by the common people is between what they consider an "*inward*" and an "*outward* eruptive fever." When the fever throws out an eruption of some sort or other on the skin, the case is considered favorable; but if no eruption appears the case is then called one of "*inward* fever," and is sure to be fatal.

It is evident that under this category of "inward fever," may be included all imaginable diseases. The occurrence however of a very fatal epizootic disease among domestic animals, at the same time or season that some exanthematous epidemic appears among

the people of the same district, is certainly not uncommon and deserves notice; on these occasions popular belief assigns to both diseases the same origin, nature, and name. At a Meeting of the Medical and Physical Society of Calcutta, a few years ago, a very interesting account was read of an Epidemic at Penang, from the pen of Dr. Oxley, wherein it was stated that at the time the Small Pox was raging in the Settlement, a very fatal disease, which went by the same name, destroyed a great number of horned cattle, poultry, pigs and sheep. The same thing has occurred at Ceylon, and in many parts of the Indian Peninsula. I was not surprised therefore to learn early in the autumn of last year that the cattle in and about Calcutta were dying in great numbers from Small Pox. I visited all the ("Gowkanahs") Cow sheds I could hear of, and inspected very many sick cows; but not one had any pustular eruption which I could discover on any part of the body. I saw several young, fat, clean and healthy looking cows die, after about three days fever, with convulsive tremors, blood-shot eyes, and parched mouths. These cases the Natives persisted in calling still *Mattah*, but of the violent "inward" form, "not permitting the discharge of humours on the skin." I observed in others, and generally for a few days, signs of fever, such as panting, lowing, thirst, loss of appetite, then followed violent purging, profuse salivation and pituitary discharge from the nostrils; but on the fourth day ulceration of the tongue and pallet, with bloody purging followed, and death occurred usually on the 4th or 5th day. In a good many cases certain rough elevations were pointed

out to me on the skin, having the hair turned back or ruffled over a small inflamed phlegmonous base. A number of these undoubtedly were produced by the burrowing of vermin or bites of insects, but many may also have been pustular without supposing them possessed of a specific character. As no possible good could be expected from experimenting upon human subjects with the matter from such pustules or ulcers, and the consequences could not be foreseen, I did not consider myself warranted in inoculating any children either from the fresh matter or the scabs which formed in any of these animals.

Varicella Bovilla.—Except in three cases out of many hundreds which I inspected, I never found anything like papulæ, vesicles, or pustules *on the teats or udders* of cows. Two of these three cases occurred in the dairy of my friend Mr. Rustomjee Cowasjee, and one in Mr. Blaquiere's compound. The fever was slight and all of them recovered perfectly. The eruption on Mr. Rustomjee's two cows (one a young China cow, the other an imported English cow with a calf at her heels) was confined to the udders. For three days previous to its appearance there was well marked fever with purging and loss of appetite. On the morning of the fourth day several small red spots were perceived on each teat, mostly near the root, but not in the least degree elevated nor surrounded by the slightest inflammation; they even disappeared on pressure. On the following morning they were slightly elevated but still without any inflamed base or areola. In the evening some of them had dried, and a small circular scale of cuticle could be detached from each by a forceps. A slight limpid exuda-

tion appeared to take place from each of these denuded surfaces, which subsequently dried into a thin scab; I therefore punctured one with a fine pointed lancet and had the satisfaction of seeing a small pellucid drop of serous fluid ooze out from the opening.

On the 14th of January, (the next morning,) at day light, I opened five or six of these vesicles which had not yet dried up, and from these with difficulty I inoculated three healthy Bengalee children (assisted by Dr. R. M. M. Thomson,) on two places on each arm.

On the following day both those vesicles which had been punctured, and all the others, had quite dried up; in a day or two the little scale of cuticle attached to each dropped off, leaving no mark of any sort. From the moment of appearance of the eruption the animals seemed perfectly well—resumed their food, and gave milk as usual. The appearances on the teats of the English cow were precisely the same with those above described in the China cow, but the vesicles were fewer, not more than six or eight could be counted altogether.

In Mr. Blacquiere's Bengalee cow we had been told by the Cow-keeper, with the usual exaggeration, that there were numerous large vesicles all over the teats and udder, and I went with Mr. R. O'Shaughnessy, prepared for a grand field day, having sent thither in advance four or five little black children to be operated on. On our arrival however we found precisely similar appearances to those already described, the vesicles on the teats were rather more numerous perhaps—quite distinct, without any areola, and already

drying up. Strange to say, among all my professional brethren and all the Veterinary Surgeons of my acquaintance in Calcutta, there was not one who had ever seen the Cow Pox among cows in England. The only drawings of the disease which I possessed or could lay may hands on were those contained in Rayer's Atlas, which gives a highly colored portraiture of the Cow Pox on the teat of a cow "after Sacco." I need hardly say that the disease above described, though decidedly exanthematous, bore no resemblance to the Cow Pox of Gloucester, nor indeed to any other bovine disease, with whose description I am acquainted.

May it not possibly be analogous to *varicella* and other minor varioloid diseases in man, the last in the scale of eruptive fevers, communicable by epidemic infection to animals of their own nature, but not transferable to others of a different species, nor possessing any peculiar prophylactic powers.

It is almost needless to add that no results followed our experiment.

Variolation of Cows.—The present is perhaps the most fitting time to mention the utter failure of my numerous efforts during the last six months to inoculate cows with the human Small Pox. The attempt was made in at least thirty different cases at the Chitpore Small Pox Hospital, commencing early in January, and continued up to the present hour ; the subjects of experiment have been cattle, most carefully selected for the purpose according to the methods so skilfully devised and clearly pointed out by Dr. Thiele and Mr. Ceeley, for the successful *variolatian* of the cow, descriptions of which, sufficient for all purposes, we possessed in

the Report of the Provincial and Medical Association, held at Liverpool 1839, in Dr. Baron's enthusiastic volumes, and the pages of the British and Foreign Quarterly Medical Journal.

Besides selecting the youngest, healthiest, and quietest cows to be found in the market (giving milk to their first calf) and subjecting them to punctures and setons not only at the roots of the teats, along the absorbent glands in the groin and axilla, under the jaw, at the root of the ear, &c., but also with particular care in the mucous membranes of the vagina, nostrils, and lips, I was careful to envelop their bodies with the clothing taken from Small Pox patients in Hospital, which was thoroughly saturated with Small Pox lymph every morning, having been wrapped round the punctured limbs of the patients for the whole previous night; yet, except in one single instance my efforts were utterly fruitless and a further detail would be quite superfluous. In the case alluded to, a solitary circular pustule about the size of a pea without central depression was discovered near the root of one of the posterior teats upon the udder of a cow whom I had inoculated ten days previously with Small Pox lymph, and had cast down in order to repeat the operation in consequence of the supposed failure of the first attempt. The pustule was inspected on the following morning by several professional gentlemen, as well as by Mr. Hughes, Veterinary Surgeon of the Body Guard, who declared it undoubtedly to be Cow Pox, such at least as he had seen frequently in the Upper Provinces. The areola was then scarcely perceptible, the pus discharged on being punctured was found to be quite inspissated,

and although by careful and difficult dissection it was certainly introduced into the arms of three children, no effect whatever was produced. My disappointment has been the greater since in no other case had any result whatever followed the inoculation ; and it is barely possible that the want of success in this one may have been owing to our tardy discovery of the existence of the pustule.*

I inoculated with Small Pox matter four sheep in the groins, after having the parts cleanly shaved: They were all giving milk to their first lambs. In three of them acute inflammation was speedily set up in each puncture, and on the following day suppuration and afterwards ulceration.

Mortality of Cows.—It will be seen from the subjoined table that the mortality among cattle commenced much about the same time with that caused by Small Pox among the inhabitants.

TABLE F,

Shewing the number of Cattle said to have died of Mattah *within the Town of Calcutta, from* 1*st September* 1843 *to* 1*st June* 1844, *(Thannahdar's Report.)*

September, ...	33	February, ...	543
October, ...	19	March, ...	126
November, ...	125	April, ...	11
December, ...	429	May, ...	13
January, ...	934		

* The following memorandum of this case was drawn up by Mr. Naylor, the Sub-Assistant-Surgeon in charge of the Cheetpore Hospital, where the experiments were conducted.

"27th April 1844. The cow inoculated was a healthy black one, about five years, with a calf five months old at her heels, said to be her first calf; she was then giving nearly two seers of milk daily, and had a white full udder and small clean soft white teats.

The mortality in January had become very considerable indeed in Town, so much so as to affect materially the supply of milk and butter, but was reported to be much greater in the Suburbs where all the slaughter-sheds are situated. It was asserted with much probability, that the Native Butchers in the Suburbs were in the habit of slaughtering their cattle the moment they suspected them of having caught

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The subject in Hospital from whom the virus was taken was a Hindoo. At about 24 years, with *distinct* Small Pox of ten days standing, all the pustules were well developed, most of them having the central depression, but some presenting a regular conical appearance. The matter in some of the pustules had become rather yellow, but the greater part contained perfectly clear fluid, which was that alone used.

The cow had that morning been brought from Kidderpore, a distance of about eight miles, was well washed soon after her arrival, and the body well dried. At 4 in the afternoon she was thrown down and the feet fastened together, the lower parts of the abdomen and the udder were shaved and a number of scarifications made along the course of the inguinal absorbents, and at the roots of the teats, some incisions were likewise made through the skin which was dissected a little from the cellular tissue underneath, causing a slight hœmorrhage from the wounds, which, however, soon ceased; Ivory points were then charged with lymph from the punctured pustules of the patient's arm, and by these the incisions were freely wetted with matter three different times at short intervals; small pledgets of cotton soaked in lymph were introduced between the lips of some incisions, after which the parts were again moistened with large drops of lymph with a brush. The operation was commenced at 4 P. M. and lasted nearly two hours; the animal was then allowed to rise, her head was made fast between two pillars and the hind legs were fixed with ropes to a peg driven into the floor so that she could neither lick nor in any other way disturb the parts inoculated which were left exposed till night; chopped straw and mustard meal soaked in water, which is the common diet for cows among the Natives, was given her. Of this she partook plentifully, and remained in this state till 9 P. M., when the parts inoculated were wrapped in cotton cloths belonging to the patient, well saturated with the lymph which oozed during the day from the punctured pustules on his back and arms.

the disease, and stories circulated of infected beef being seen and sold in the market covered with dreadful marks of "inward" Small Pox. How far this may have been the case must remain doubtful. Mr. Allan Webb, Garrison Assistant Surgeon of Fort William, appears certainly to have detected some meat supplied to the European Troops, which was of an improper description, but whether this was not a matter of frequent previous occurrence, and whether

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28th April 1844, Morning. The cow looked quite lively and took her food eagerly. The bandages which had loosened during the night were again properly adjusted; At 4 P. M. she was again thrown down and fixed, the incisions made the day before were deluged with fresh lymph from the patient's arms; some new incisions were made and filled with lymph, the cow was then allowed to rise and tied in the same manner as before, and at 9 P. M. the bandages were exchanged for fresh cloths from the subject quite moist with lymph.

29th April, Morning. No constitutional disturbance could be observed, but the parts inoculated looked slightly irritated and she would not submit to be milked.

30th April. There was loss of appetite and the cow looked dull with her head drooping down; the local symptoms had increased and the parts looked inflamed. Bandages about the udder were renewed, wet with fresh virus from the subject.

1st May. The constitutional symptoms were much the same, but the inflammation about the incisions had almost entirely abated.

2d May. The cow was thrown down and the parts examined; scabs had formed on the incisions which were almost quite dry, the cotton which had been introduced in some of them remained in, and adhered to the scabs. The setons were drawn off and at 5 P. M. she looked lively and took her food with appetite.

3d May. She continued the same.

4th May. Ditto ditto.

5th May. While preparing to inoculate the cow again from a Hindoo female patient at about twenty-five years, a distinct circular vesicle filled with their yellow matter about the size of a small pea was seen on the lower part of the abdomen towards the left side of the udder with a slight red areola around it, not connected with any of the incisions or punctures.

a little more vigilance in the inspection of the meat might not have sufficed to prevent all such improprieties and obviated the necessity for total abstinence which ensued, I am not prepared to say. The panic among all beef-eaters became universal, and did the Hindoo religion admit of proselytism, its converts might be said to include the entire European and East Indian population, for I believe that for many months scarcely a morsel of the flesh of the sacred animal of Hindoo worship was swallowed in Calcutta. It was not generally known that the mortality was at the same time very great among fowls and pigeons. I visited along with my zealous friend Mr. Blacquiere several poultry yards and pigeon houses in and about the Town, from which we have seen the dead fowls taken out by dozens of a morning, said to have died during the night of the universal Small Pox. I could see nothing the matter with the birds unless a certain degree of swelling and redness around the eyes might be indicative of their disease.

6th May, 7 A. M.—The cow was laid down and the pustule examined by Messrs. Stewart, Thomson, R. O'Shaughnessy, Goodeve, and Ledlie, also by Mr. Hughes and another Veterinary Surgeon, the former of whom declared it to be perfectly identical with the *Cow Pox* which he had frequently seen in this country. The pustule was punctured, and with its contents, which unfortunately were quite inspissated and of a purulent appearance, four children were vaccinated.

Names of Children.	Age.	Caste.	Remarks.
Badoo ..... Girl,	6 years,...	Mahomedan, ...	Failed.
Rumjoo..... Ditto,	3 ditto, ...	Ditto, ...	Ditto.
Madhub ..... Boy,	5 ditto, ...	Hindoo, ...	Ditto.
Dwarkynauth Ditto,	2 ditto, ...	Ditto, ...	Ditto.

Poisonous effects of diseased meat. Reported on by Dr. Hosack, of New York.

The importance and necessity for inquiry into this matter greatly impressed me, and my interest in it was not a little enhanced by a very remarkable pamphlet which was put into my hand about this time by Dr. W. B. O'Shaughnessy, who had but lately returned from America, and who spoke in the highest terms of the high professional character, talents, philanthropy, and integrity of its author Dr. Hosack, of New York. It appears that in December 1842, a number of cases occurred in that City of a virulent disease, resembling in its primary symptoms ordinary Cholera, the cause of which was not suspected until a multiplication of cases in different families and in the hands of different practitioners accidently led to a consultation resulting in a strict local inquiry and the ascertainment of "the *fact* that each of the "patients, 43 in number, had partaken of a quantity "of smoke-dried-beef obtained from a neighbouring "Grocer, and it was not to be doubted that the beef "in question was impure, unhealthy, or contained "some poisonous principle." With a praiseworthy regard for the health of the City, the municipal authorities immediately directed an investigation to be made by a Committee of professional men, consisting of Drs. M. Post, Hosack and Chilton, whose report to the Mayor and Alderman of the City was printed. The symptoms described, were those of common Cholera in the first place, but these subsequently assuming the most aggravated form, "nature appeared taxed to the utmost to eliminate from the system the noxious matter with which it was infected." As a

consequence of this excessive action the greatest prostration followed; the functions of the nervous, the muscular and the digestive systems were each impaired, and a protracted and tedious convalescense followed. On a post mortem examination in one case, " the blood was found not coagulated ; it followed the course of the knife freely as in cases of death by drowning, lightning, &c., the mesentery was enlarged, the mucus coat of ilium exhibited a highly inflamed appearance, which was confined to a space of about six inches in length, embracing the entire calibre of the intestine. The stomach, brain, and other organs appeared not to have suffered any lesion." A very elaborate chemical examination of the meat was instituted without leading to the detection of any mineral or vegetable poison, and a variety of experiments were then made upon animals in order to notice what effects the article in question would produce upon them. These it is not necessary here to detail, it may be briefly mentioned that in whatever form the meat was administered, either as food or by injection of its decoction into the veins, it produced in all the symptoms of Cholera, followed speedily by death or slow recovery. On examination of the bodies of animals thus destroyed the blood was always found to be not coagulated and much darker than natural, the heart greatly dilated and engorged, the stomach and intestines much injected, and presenting a highly florid phlogosed appearance. The opinion being entertained that the beef might have produced its deleterious effect from the occurrence of natural decomposition, the report was delayed in order to ascertain what effect beef in this condition would

have upon animals. Several pounds of beef were accordingly exposed until it became slightly tainted. A portion of it was then given to the same dogs which had been the subjects of the preceding experiments. No effect however followed. The beef was then kept until it became quite putrid, but although the animals partook of it freely no symptoms of disease were observable.

The meat itself which had produced the alarm, and excited the interest, and led to the inquiry was then traced, and it was ascertained to have come in a smoke-dried state to New York from the district of Indiana and Illinois, in the Western States, North of the Mississipi, "where a disease "prevails peculiar to animals, and which had long "been known to exert a deleterious influence on "all individuals of the human race who con- "sumed either the flesh, the milk or the butter "of these animals.

"In the early settlement of the country the ex- "istence of this scourge in any given locality was "frequently sufficient to break up many a commu- "nity that was in other respects most advantageously "situated. The condition on which many large set- "tlements *exist at the present day*, is entire absti- "nence from the flesh of their cattle as well as the "milk, butter, and cheese made in their own district "of country."

The localities of the disease are frequently circumscribed. In one it may be traced for nearly 100 miles, running parallel to the Wabash River, again it is found to occupy an isolated spot comprised in an area of 100 acres.

The disease attracted the attention of Hennipin, who ascended the Western Rivers early in the last century, and its ravages are still confined to the same districts in which it originally appeared, being unaffected by the settlement of the country or its consequences. It prevails with equal violence in summer as in winter, and is unaffected by changes of weather as respects dryness or wetness of the atmosphere.

"It was among beef cattle, sheep, horses and goats. These animals are frequently affected with the disease without manifesting any of its symptoms until developed by violent exercise; a precaution always taken by persons who slaughter cattle raised in those districts in which the disease is known to exist. The appearance of the beef is not peculiar, though it has been supposed by some to be rather darker in its color, and to become sooner putrified than the flesh of sound cattle; there is nothing remarkable in the taste, nor are its poisonous qualities corrected by the ordinary process of salting.

"The quantity of cream used as commonly a sufficient addition to the coffee taken at a single meal, as well as the smallest quantity of butter or cheese, has been known to produce the disease." Dr. Graff found that dogs fed on an ounce of butter or cheese, or on four ounces of beef either raw or boiled, three times per day, invariably died within six days, or often earlier. The death was found to be accelerated by exercise, inducing violent spasms, which often arrested the animals as they were running at full speed. The sulphuric and other strong mineral acids,

the chlorides of lime and soda, had no effect in modifying the poisonous principle of the flesh, which after being subjected to them, was thoroughly washed and given to several dogs, and was found capable of exerting the same deleterious effects as before. It was however ascertained that water in which the infected beef was boiled did not partake of the poisonous quality of the beef; hence it is inferred that soup might be used with impunity. It does not seem that it can be transferred by inoculation, though it appears that the flesh of all animals which die of it, is capable of reproducing the disease, whether they have had it developed spontaneously, or have contracted it by having taken of the flesh or products of other animals.

The cause of this scourge is still involved in mystery: Some conceive it to be of vegetable origin; others are of opinion that it results from the operation of a mineral agent.

The grass of the infected districts, when dried into hay, seem incapable of producing the disease; and again, it prevails often with great virulence when the ground has been covered with snow for several weeks. Another authority attributes the cause to a fungus which springs up and is eaten by the animals; but the preceding fact would render it difficult to account for its production by this hypothesis.

When the disease is developed in cattle, food is refused, the vision is impaired, the eye becomes fiery red, the animal staggers and falls, or, if it attempt to rise, trembling of the whole muscular system prevents it from maintaining the standing position.

After repeated convulsions, it dies, never lingering beyond a few hours. Sometimes death is produced in a few minutes, as if the animal had received a blow on the head.

" If the flesh, milk, or butter of an animal affected with this malady, be used as food, in a space of time, varying from the 3d to the 10th day, a peculiar fetor of the breath is noticed, which becomes greater as the disease advances, until it is fully developed, and then slowly disappears; loss of appetite, great pain and excessive irritability of the stomach follow, with general febrile symptoms and constipation: the brain becomes affected, the intellect impaired, and the strength exhausted by constant vomiting, which, uncontrollable by any remedy, exhibits at first the contents of the stomach, then dark bilious matter or glairy mucus tinged with blood, and finally a black material resembling coffee grounds; the tongue becomes enormously swollen, the pulse rapid, pain increases, fœtid and bloody dejections ensue, and death soon follows, unless the disease be checked by appropriate treatment.

" The cases however present different modifications according to the age, sex, condition of the system, &c. The disease proves fatal in the great majority of instances. In those who recover, the period of convalescence is very protracted, and the patient retains not the slightest recollection of the events of his illness, or even of occurrences that took place some days before the attack.

" The blood drawn at the beginning of the illness is buffy, dark, and thick, it rapidly coagulates, the serum being small in quantity and of a yellowish or

orange color: in the latter stages the coagulum is small, brown and gelatinous, the quantity of serum is large, which is of a red color.

"Dissection reveals traces of inflammation on the coats of the stomach and intestines, with contraction in the size of these organs, effusion of serum into the peritoneum, dark engorgement of the liver, distention of the gall-bladder, and marks of high inflammation in the brain and its appendages."

The treatment found most successful, was moderate venesection in the early stage, local depletion by cups, cold applications to the head, blisters over the region of the liver, and later on the upper portions of the sternum, nape of the neck, or on the scalp and extremities: the exhibition of the more unirritating purgatives, as soon as the stomach is sufficiently composed to retain them, as calomel, either alone or followed by olive oil, assisted by frequent enemata. The secondary fever which always supervenes, must be treated on general principles, adapted by the practitioner to the peculiar features of the case under his care.

The people residing in those sections of the country in which the disease prevails, carefully abstain from the use of animal food, the product of their own locality; but with a reckless disregard of human life, many of them transport to distant cities, butter and cheese which have been manufactured among them; cattle are also doubtless driven off with the disease lurking within them, since it appears it may remain a long time dormant, until developed by exercise or some other accidental circumstance. Deaths have frequently occurred in Chellicothe, Ohio, in Louisville,

Kentucky and in St. Louis, Missouré, from this cause, although these towns are located at a distance from any of the infected districts.

"From the inquiries which we have made we have ascertained that immense droves come from the West to supply our markets; they are driven across the mountains and reach New York from the South, hence they are called by dealers "Southern Cattle." Many of these cattle become diseased on the route, and are then exchanged for the pasturage of the herd. In this condition they are frequently slaughtered by the farmers, the flesh sent to this City and exposed for sale, producing in persons, who make use of it, symptoms of aggravated Cholera Morbus. Physicians attest that they have frequently met with such cases, which it was impossible to account for in any other way.

"Numerous instances occur, in which the butchers of our city have found the viscera of animals slaughtered, in a highly diseased condition; in some cases, being almost disorganized. The liver, especially in Southern or Western cattle, is very liable to be thus affected. The undersigned however, avail themselves of this occasion, to say that no instance has occurred to them, in which this class of our citizens have ever permitted such beef to be placed upon their stalls, in our markets; but, on the contrary, they believe them solicitous to protect their customers from a fraud, so dangerous in its consequences, and so much in opposition to their own true interests."

The Report proceeds to state that cattle frequently become sick when driven from a long distance, even where no original disease existed. Mills says, "If

oxen are put upon running at full speed, or if they are otherwise over fatigued at any time of the year, but especially in summer, they contract diarrhœa or fever; for this animal being naturally slow, and rather adapted to easy labor than to swift motion, is greatly hurt if forced to go beyond his strength. If calves are slaughtered under these circumstances, the flesh, as an article of food, becomes a fruitful source of derangement, since every organ of the animal economy is directly dependent on the digestive system."

"A disease of a very fatal character among cattle is frequently met with by our butchers, drovers and dealers, called by them bloody murrain. When attacked, the animal refuses food, shews great depression of the vital forces, the respiration becomes labored, the vision impaired, the throat is swollen, violent tremors ensue and death soon follows. When examined after death, the blood is found to be very dark and grumous, the liver disorganized, being soft and pulpy, the milt or spleen is enormously large, and filled with a dark gelatinous fluid, the brain is soft, and very much surcharged with blood. It most frequently occurs here among cattle that have been driven from a long distance, particularly from the South or West, though it sometimes occurs among those which are raised in our own immediate vicinity. This affection generally prevails during the summer months, and *is considered infectious.* The carcasses of animals which have died from this disease are usually disposed of at six and seven dollars per head, the hide and fat considered to be worth that sum. There is reason however to believe that the flesh is

often made use of by unprincipled persons in the manufacture of sausages, beef puddings, &c.

"Instances of modified putrifaction rendering wholesome meat noxious also frequently occur; in these cases the most recent investigations of Dann, Buckner, and others, lead to the conclusion that the poisonous principle resides in a fatty acid, which when purified by distilled water has a yellowish color, a peculiar nauseous smell, and a disagreeable oleaginous taste. When decomposition advances farther, and the animal matter becomes putrid, Lasaigne found it consist of carbonate of ammonia and a fœtid volatile oil. As examples of this form of poison, may be mentioned the sausage poison, that occurring in a particular kind of cheese and in bacon. On the continent of Europe, and particularly in Wirtemburg, the inhabitants frequently suffer greatly from using those articles of food."

From a consideration of the above statement and observations, the Committee came to the unanimous conclusion—

"The irresistible conclusion therefore to which the undersigned are led, is that the animals from which the beef in question was taken had been affected with some disease rendering their flesh highly poisonous as food."

The able Report of the Committee concluded with the following words:

"The foregoing cases are cited to show the dangerous effects produced on individuals by the consumption of unsound meats. The Committee do not however consider that they are possessed of any proof that the beef which they have examined had advanced

to any of the stages of putrefaction, none of the principles of it having been detected by the closest analysis. An instance of poisoning however occurred about two years since in this city from eating "head cheese," in which the fœtid volatile oil spoken of as characteristic was instantly developed.

"The undersigned have not been able to trace the meat experimented on farther than to Dutchess county on this State, that it was there slaughtered and sent down to the city. Although the evidence is not correct, there cannot be a doubt as well from the history of the case as the results of the analysis and the experiments, that the animal from which it was taken was in a diseased condition, rendering the flesh exceedingly unhealthy and dangerous as food.

"In conclusion, the Committee avail themselves of this occasion to urge upon the constituted authorities the absolute necessity of adopting some method which shall in future protect our citizens from occurrences of so dangerous a character.

"For this purpose they most respectfully propose the erection by the city of one or more extensive abattoirs, or slaughter buildings, similar in plan to those erected by the French Government in 1809; and they would also suggest as an improvement to that plan, the appointment by the Common Council of the requisite number of competent persons, whose duty it shall be to inspect all animals slaughtered for the use of the city.

"By this arrangement, they are persuaded that the citizens would gain greatly by the security they would possess that the food consumed by them was pure and healthy; by the cleanliness which would be

observed in the establishments; by the removal of the buildings which at present constitute offensive nuisances; and in the certainty that the system would be burdensome to none, but, on the contrary, would recommend itself on the score of convenience and economy.

All of which is respectfully submitted.

(Signed) MINTURN POST, M. D.
" ALEX. E. HOSACK, M. D.
" JAMES R. CHILTON, M. D.

New York,
February 26*th*, 1842."

The very interesting pamphlet, whereof the above is an imperfect summary, falling into my hands at such a moment greatly interested me, and stimulated my inquiries into the nature of the epizootic malady prevailing in and around Calcutta, some connection between which and the mortality among the inhabitants was, to say the least, a matter of universal belief.

My indefatigable friend Mr. Blacquiere, who at the age of nearly 80, retains all the philanthropic energies and affections of 18, at once entered with me into the research. His replies to my queries I subjoin in his own word.

Q.—Are there any Natives who habitually consume *dead meat*—who are they—are they numerous in Calcutta—what parts of the town do they dwell in—are they generally healthy or sickly—Have you ever heard of any peculiar sickness among them, caused by or attributed to their eating tainted or diseased meat?

A.—A class called Chummars, Natives of Hindoostan, live upon dead meat. The class is numerous.

They live in different parts of this town and are healthy. I have never heard of any peculiar sickness among them attributed to their eating tainted or diseased meat.

Q.—Have you ever known or heard of the disease called Matta, among cattle, being communicated to those who handled or milked the cows?

A.—I have not.

Q.—Has there within your recollection been any Small Pox Epidemic in Calcutta affecting the cattle and the population in the same way as the present?

A.—In or about the year 1795-6, there was a Small Pox Epidemic, in and about Calcutta, during the months of January and February, during which the mortality was great among men and cattle of all sorts, but I have no record of the number.

Q.—Do the Natives consider the human Small Pox the same disease as that which destroys their cattle—and why?

A.—They do—the cattle have what the Natives call the Matta, or Small Pox, at the same periods of the year that the human species are affected with it.

From Mr. Monteith, the head of an extensive Tannery concern in Sealdah, having large Government contracts for belts, boots, and Military leather accoutrements, I received the following frank and obliging letter and replies to queries.

No. 145.

"I hope you will pardon me for the delay I have made in replying to your letter of the 14th instant.

"I have answered all your questions in the form you sent, and beg leave to give you a small outline in this letter.

"In your letter of the 14th instant, you ask what were the appearance of the cattle said to have died of Small Pox—*no difference* from others in appearance.

"But the hides of less value on account of being marked from brands, sores, &c. The cattle I got generally are worn out hackney draught cattle. I have never examined any one minutely nor am I a judge of diseases among cattle. But from what information I can gain from a number of butchers and those that deal in cattle, they say that they cannot say one disease destroys more than another, but I in general get more dead cattle in the rains than any time of the year. I should say, by looking over my stock book for the last year, that I received on an average ten to fifteen per month more than formerly, this year, say since last January. The difference in the quality of a hide taken off the dead animal to one slaughtered is on account of the animal being bled, and the blood gets between the flesh and the skin, and very soon spoils the hide, makes it of a soft spongy nature by the time it is tanned.

"You wish to know if my people are a healthy race of people; they are very much so indeed, and I have not had one-sixteenth of the sickness among my men this year, to that of formerly, nor have I lost a man this year yet by death; they say they will eat any *fish*, *flesh*, or *fowl* that dies of whatever nature, only let them cook it their own way. I would not get a man to work if I entirely prohibited them from eating the meat of dead cattle. There is but one cast that eat the horse's meat, the Doony or Mater caste.

"I do not think that ever they took any meat to a market, but among their own caste.

"I will at all times be most happy to give all the information I can on the subject.

(Signed) JNO. MONTEITH.

Calcutta, 30*th April*, 1844."

Q.—You are in the habit of purchasing fresh hides for *tanning*. Are these all hides of slaughtered cattle or of cattle which die naturally?

A.—Slaughtered hides.

Q.—What number of hides in every 100 brought to you are slaughtered, and what have died?

A.—Slaughtered 2000 to one dead.

Q.—What diseases do the cattle generally die of?

A.—I cannot say indeed.

Q.—Are the dead cattle brought entire to you, or only their hides?

A.—Principally entire.

Q.—What becomes of the flesh and bones of those dead cattle which are skinned at your Establishment?

A.—The meat is mostly taken by the Moochies, and the remainder devoured by the vultures, and the bones are buried in the earth.

Q.—Have you ever found any of your own, or other people carrying off the flesh of dead cattle for market?

A.—My people have carried off plenty of it till stopped by me; but I believe only to their own caste that had not the opportunity of obtaining it otherwise.

Q.—Who purchase such meat, and what class of natives consume it?

A.—The Chummar caste only.

Q.—Is this class of natives numerous in the neighbourhood of Calcutta?

A.—Yes, numerous in the Suburbs.

Q.—Do they consume the dead meat of other animals, sheep, deer, goats, fowls, fish, when they can get it?

A —Yes, very happy to get it.

Q.—Are they a sickly or unhealthy looking people, are they more subject to Cholera or fever?

A.—They are a hardy race of people seldom sick, only through drink when to excess, and when ill principally through intermittent fevers or spleen. In seven years I have lost only fifteen men out of 100 to 120 daily at work.

Q.—Do you think that *dead meat* has ever been carried into the Calcutta *Native Bazars* and sold there?

A.—No, I do not, as stated before, only among their own caste in the Suburbs.

Q.—What way do they prepare this dead meat for market, smoked or salted; if the latter with what salt?

A.—They cut it in stripes and dry it in the sun; no salt whatever used—sometimes they half grill it and then take it away.

Q.—Have you any idea of the *price* it sells at?

A.—No, I do not believe it was sold for money to any except to their *jat bys.*

During the late Epidemic among Cattle.

Q.—What diseases did the horned cattle die of generally?

A.—Cannot say more than was told me; some of them with the *Small Pox* and others of the *bloody murrain.*

Q.—Did you see any dead cattle with well marked *pustular disease* on the abdomen, udder, teats, and soft parts?

A.—Cannot say, never having examined them so minutely.

Q.—Were the dead cattle generally emaciated or fat and plump. Did they die suddenly or of a long illness?

A.—Generally worn out and lean.

Q.—Among the hides of dead cattle did you find any deep ulcers or marks of round pustules into the true skin which appeared to be caused by a disease like Small Pox, causing holes in the skin?

A.—None whatever.

Q.—Were any of the carcasses opened and the viscera examined to see if they were healthy or diseased?

A.—No, none.

Q.—What difference did you observe in hides of slaughtered and of dead (naturally) cattle?

A.—The usual *difference*, the slaughtered preferable to the dead, not having been bled, evidently the hide of less value.

Q.—What was the supposed mortality among cattle this year and formerly?

A.—Not more than last year—the average is ten per month in my Tannery from 1st of January.

(Signed) JOHN MONTEITH.

From Mr. Teil, another large Government Contractor and head of an extensive Tannery near Calcutta, I have been obligingly favored with the following information:

Q.—Do you purchase fresh hides from butchers, or do you slaughter cattle yourself?

A.—I purchase fresh hides from butchers daily, but do not slaughter any myself.

Q.—Are the hides of slaughtered cattle worse or better than those of cattle who die naturally, can you distinguish these hides from each other when fresh?

A.—Hides from slaughtered cattle are considerably better than those from cattle that die naturally. I can in almost every case distinguish the one from the other when brought fresh to me.

Q.—What diseases do cattle chiefly die of in Bengal?

A.—Chiefly I believe of two diseases, that of *Pox* and *Matta.*

Q.—Is the disease called Matta common *every* spring, or does it occur at uncertain and distant intervals of time?

A.—No, it is not common *every* spring although that is the time it generally prevails.

Q.—Have you seen many cases of what is called *Matta* this year, and what were the symptoms?

A.—No, I have not; the symptoms are, I believe, generally a swelling in the head and tongue of the beast.

Q.—Have any cattle had pimples or pustules about the udders resembling the Cow Pox you have seen at home?

A.—I have not examined so minutely as to observe whether such is the case or not.

Q.—Did you ever hear in this country of the attendants or milk-men getting an eruptive disease from handling the teats of such cows, or the heels of horses?

A.—I have never known such to be the case.

Q.—Is there not a numerous class of Natives who consume flesh indiscriminately whether slaughtered or not? Have you seen or heard of any of them suffering illness from eating tainted meat or the flesh of cattle who had died of *Matta?*

A.—There is one class of Natives called Chumars, who I believe eat meat indiscriminately, whether slaughtered or not. I have never known any of them to suffer illness directly from eating such meat.

(Signed) JOHN TEIL.

As regards the nature of the recent Epidemic, the information derived from Mr. Greenfield, an extensive cattle dealer in the neighbourhood of Calcutta, and the only person whom I have met who had seen and was practically acquainted with cattle and their habits, diseases, treatment, &c. in Europe, the following information is valuable and interesting.

Q.—I believe you keep a Cattle Farm and Slaughter House at Acra. Be so good as to say what cattle are *fed* on your Estate (I mean fattened and prepared) for slaughter, and what are purchased ready for slaughter, or do you *prepare all* yourself or buy all ready?

A.—Pigs, sheep, bullocks, buffaloes, goats and poultry of every kind are fed on Acra Farm. I breed from 2 to 300 China pigs yearly, and feed them for slaughter on the Farm. I purchase all my pigs for curing *lean*, and fat them five to six months before

slaughter; some of my beef I fat myself and some I purchase from others when they are fattened; I cannot kill beef on the Farm as my people are all Hindoos. I get Mussulmen to do it out of the Farm.

Q.—Are the "black cattle" subject in Bengal to an Epidemic disease (called Matta) annually or only occasionally. Have you ever seen it in your own Farm and is it usually attended with eruption of *Pocks* on the udder and belly and teats, or is the disease characterized more usually by ulcerated mouth, bloody purging and fever. Do you not yourself *distinguish* several diseases some with Pocks and some without, and which is the most common?

A.—I have been here now nine years, and I have never had any disease among my cattle until this year, and this year I have lost 60 cows with a disease that has been all over our neighbourhood something like *strangles* or *glanders:* it first commenced on bullocks and then on my buffaloes; no eruption on the skin or udder or teats, only the eyes, tongue and throat were affected, when the animal died from being strangled, as the passages were completely stopped, they *were all suddenly taken ill* and seldom lived more than three days, many only one; no purging, no discolour of water appeared. I have seen the Pox in England among cows but this is nothing like it. I have seen two or three cases here of what are called in Sussex the Puck; it commences on the bullock in the hind leg generally and runs all over his body under the skin until it comes to his heart; it is easily known by striking your finger on the animal; its all hollow.

Q.—What has been the true Epidemic of this year so fatal among black cattle?

A.—The disease has not confined itself to black or white cattle, all colours have fallen from it. The *strangles* I think is the disease or *glanders*.

Q.—Did it affect any other cattle—swine, sheep, goats, fowls, pigeons, or horses?

A.—I had none except my bullocks and buffaloes affected with any disease, the cattle were mixed with each other on the Farm.

Q.—To what circumstance or circumstances do you attribute the Epidemic?

A.—I cannot say whether it was the grass they eat or the air.

Q.—Have you ever known it or do you from grounds believe that the disease has been communicated from the animals to their attendants, and what are the alleged symptoms in such cases?

A.—I do not think the disease has been amongst any of my men that have been attending the animals or those that skinned them, as not one man has been ill from it, and I have eight men constantly amongst them.

Q.—Do you tan any hides? if so only those slaughtered at Acra or by purchase of fresh hides from others: What is the difference between the hides of slaughtered and of dead cattle?

A.—I only cure the hides of my own cattle. The hide slaughtered is white and clean. The hide of a dead bullock is red and bloody and not of so much value.

Q.—Among the numbers killed at your place what viscera have most frequently been found to be diseased?

A.—*Pigs*,—the liver and kidney is the only disease we find fatal: the "Measles" is not fatal, but frequent;

and the meat is always thrown away unfit for use as it is one mass of corruption; Its presence is never known until the animal is killed as no appearance on the skin. *Bullocks*,—seldom any disease inwardly, as we only deal in fat bullocks, and no bullock will fatten if it is diseased.

Q.—Is liver complaint most common among cattle, or ulcerated bowels (i. e.) dysentery, or diseased lungs?

A.—Liver and the lungs are what we generally find affected, seldom we have dysentery among our cattle; when we do it is in the rains, when the grass is young and *flashey*.

From all the information I have been able to collect, and from my own observations, I conclude that the Cattle Epidemic of Bengal does *not* prevail statedly and periodically—It does *not* affect those employed about and among them,—It does *not* confine itself to milk-giving-cows but destroys all horned cattle,—It is *not* the Jennerian Cow Pox of Gloucester. There are several fatal diseases among cattle, some attended with eruptions, and others without any,—the *latter* are the most fatal. Of the former some are milder than others. None are known, or said, or supposed to exercise any prophylactic power against Small Pox, nor to secure the animal affected from a second attack.

Calcutta Slaughter-Sheds and Meat Market.—The following polite communication was addressed to me by Mr. Mytton, Magistrate of the 24-Pergunnahs, (Suburbs of Calcutta,) not long after his perusal of the aforementioned American pamphlet, which I had sent to him.

From the Magistrate of the 24-Pergunnahs,

To Dr. Stewart, m. d., *&c. &c.*

Dated Allipore, 26th April, 1844.

Sir,—On receipt of your note dated the 14th instant, I deputed my head clerk Mr. Floyd to visit all the butcher's shops in the Suburbs and to collect all the information regarding them and the sale of meat which he could obtain. The result he has embodied in a very intelligent Report, a copy of which I annex. The statistical information being derived from the butchers themselves is not likely to be very exact, but it may be considered as pretty certain that the number of cattle slaughtered at the present time is much smaller than at the corresponding period in 1843. You will gather that an opinion is prevalent, even amongst the Natives, that it is not quite safe to eat *beef*, which is not at all surprising, considering the great mortality which appears to have taken place among the cattle.

2d. My attention has been attracted by the inquiry and inspection which has been made, to the state of the several slaughter houses, and the proprietors of those which are in a filthy state have been allowed a reasonable period to remedy the nuisance brought to notice, and if the order be not attended to they will incur penalties under Act XXI. of 1841.

3d. I shall in future have a frequent inspection of all the slaughter houses made by my European subordinates, and occasionally by myself, and I hope by these means to effect some improvement. It is however next to impossible to persuade or compel Natives to adopt a complete measure of improvement

involving an immediate outlay, and without such it is scarcely to be expected that the nuisance can be effectually obviated.

4th. There is no doubt but the river side is the only place where a sufficient quantity of water and a proper drainage for the blood, &c., can be obtained, and it is a matter not unworthy the consideration of Government whether it would not be desirable to purchase two spots of ground one to the North and one to the South of Calcutta, either on this or the opposite side of the river, and to construct suitable slaughter houses with every convenience for disposing in a proper manner of the bones and garbage. These might be placed under European management, and the slaughter of animals for sale at any other place within a certain circuit, or the sale of any meat not slaughtered at these establishments forbidden. Under such a system there might be some hope of the sale of unwholesome meat being prevented. If it be objected that this would destroy competition, it may be urged in answer that there is scarcely any competition at present, the difficulty of procuring ground for the establishment of slaughter houses, whether on account of the prejudices of Hindoos or the well-founded objections of other neighbours on the score of nuisance, ensures to *Peer Ally* almost a monopoly.

5th. I perceive that the plan advocated by me in the above paragraph was proposed by a Medical Committee at New York, in the report you sent for my perusal, and it is there stated that similar establishments were erected by the French Government at Paris, so far back as the year 1809. If it was

considered desirable in such latitudes as those of New York and Paris, to place slaughter houses under municipal control, how much more so is it in this, where the climate, the want of drainage and (at some seasons) of water, together with the slovenly habits of the Natives render supervision more necessary to secure pure and healthy food, and prevent the slaughter houses from becoming nuisances.

(Signed) R. H. MYTTON,
Magistrate.

FROM MR. J. FLOYD, *Head Clerk*,

TO R. H. MYTTON, ESQRE.,

Magistrate of the 24-Pergunnahs.

SIR,—In conformity with your orders of yesterday to inquire into certain circumstances connected with the Butcher Shops, &c. in the jurisdiction of the Suburbs' Thanas, I proceeded this morning (Tuesday, 17th April) to that of *Nowhazarree*. The first place I visited, in connection with my inquiry, was the *haut* at the Military Orphan School Bazar, where cattle from *Oolooberria* and other parts are brought up for sale twice in the week. There were a pretty good number on the ground, but not so many as have been known to be brought on former occasions. This diminution is said to have taken place since the prevalence of Small Pox: With the exception of one, (which from age or disease, or both, could not survive many days), all the cattle I saw, though some were aged and very lean, appeared healthy; at all events, were pronounced to be so by competent judges; but I was given to understand that at times cows suffer-

ing from the malady have been brought within the precincts of the *haut*, but not finding purchasers on the spot have been led out again and sold to butchers for trifling sums on the Kidderpore Bridge, for the sake (it is alleged) of their hides ; but from what I subsequently witnessed and heard I am inclined to think that some butchers find as much use for the flesh as they do for the skin. I spoke to the Manager of the *haut* not to allow admittance to such animals, and advised him to send the dealers that bring them to the Police, but it is the farmers' interest to collect all that he can, and with Natives generally, money is the primary object.

I next called at the *Kidderpore* Thana, and accompanied by the *Daroga*, visited two butcher shops situated on the opposite side of the road. In one of these was exposed for sale a couple of sheep apparently just slaughtered. I could not find fault with the mutton, but in the adjoining shop where beef is sold, I found that immediately behind it they slaughtered almost every day, in consequence of which the place was far from sweet ; plenty of skulls and bones lay about, and from their appearance I should say they had been accumulating for months. These shops are almost surrounded by huts, but the proprietor of the land would have it that he is put to some expense in preventing the place from becoming offensive. I gave him to understand that I thought otherwise, and trust he will see the necessity of removing the nuisance, for I can call it nothing else.

On the Circular Garden Reach Road I discovered one small shop, but it was closed and the proprietor absent ; here the Natives told me that Small Pox had

prevailed a short time ago to a great extent, and some were of opinion that the Epidemic carried off more *Mussulmen* than *Hindoos*. Beef they remarked was very cheap, and that people parted with their cattle for anything rather than lose them through disease. I know of an up-country cow, three or four months gone with calf, said to give almost seven seers of milk a day, sell for only Rupees seventeen, whereas, in better times, animals of her description have brought fifty or sixty if not more. They further assured me that some families have *sold off* on the first appearance of the evil among their cattle, not caring, in all probability, whether they were purchased for the knife or the plough.

At a short distance from the *Pharee*, at Garden Reach, is another shop which was also closed, and at "*Burtulla*," on the road to Acra farm, are two others, and places attached for slaughtering; on examining the beef in one of these shops I was pleased with its appearance; but a few black spots in the region of the kidney made me suspect that all was not right, I therefore made the attendant at the shop cut out the piece which I took down to the farm, and had it inspected by the Assistants at Mr. Greenfield's, who pronounced it free from disease. This meat, the *best* in the whole Kidderpore Division, was selling for only four pice the seer, and that of inferior quality in the next shop at the same price; a respectable old Mahomedan gave it as his opinion, that *much of the sickness was owing to the bad meat offered for sale*, and others intimated that, in the surrounding hamlets, both men and cattle were still suffering. The farm has lost the best part of its cows and buffaloes, and of

the Budge Budge side I heard similar accounts. Here too the butchers keep their compounds extremely filthy, of which there were loud complaints by the "*ryats*." I fear my speaking will have no good effect though I endeavoured to persuade them into something like a compliance with the order to keep them clean in future. On my way back my conveyance was stopped by a butcher who complained that some of his fraternity were in the habit of coming from town with tainted meat and selling it under price, which statement was verified almost immediately after, for opposite a village where I stopt a fakheer-looking man had some of the filthiest stuff imaginable in his basket, which he was either selling or offering for sale to some poor people, who, when they perceived that his conduct was noticed, protested against his doing so. The basket contained cloth that had not been washed for an age, and the liver, &c., of cows. I cannot describe in medical phraseology the precise state of the latter, but suffice it to say, that it was not only tainted, but covered with blotches, or more properly speaking, *perfectly ulcerous*, some of the sores discharging a yellowish substance altogether disgusting to the sight; in one bit in particular there was a large collection of matter which the vender in question removed and threw away, and a dog standing by prevented my securing it. This man came from *Kumia*, and the price he asked for the portion I brought for your inspection was about one piece.

At Kidderpore, west of the School, I witnessed a sight almost as disgustful—a liver that had become as black as ink from keeping and quite putrified, hung up in a butcher's shop for sale—I gave the owner's

servant four pice, the price demanded for it, and think it was the best bargain he made since the morning—You, Sir, have seen this as well as the former, so that I shall refrain from saying any thing further on the subject. I now proceed to notice part of a cow which had been slaughtered on the morning of the 16th, and which at about twelve P. M. this day (the 17th,) was still in the shop and going by degrees for two pice the seer—there was more than *flesh* about it, and so dry and yellow did it appear that one could feel for the poor whom necessity would drive to bargain for it, but the whole of this meat was not likely to sell in the course of the afternoon as there was other of evidently longer standing to be disposed of. Buxoo, the attendant above alluded to, said that his master had a "Kill-khana" which contained no cattle at the time. I notwithstanding proceeded to inspect the place, and found no less than six or seven cows tied together without drink or provender, and the compound in an extremely filthy condition. How Natives put up with the offensive smell this place emits I know not, but those who went in with me appeared glad when they got out again.

This day (the 18th,) I visited one of the most extensive slaughter-houses to the east of Calcutta, conducted by *Peer Allie Kupoy* of Kuma, or "Armani Bazar." The place has been apparently established at some expense, but a total absence of regularity and cleanliness, I am sorry to say, prevails. I annex a sketch of the place, and have to observe that though the butchers pursue their calling without experiencing the least ill effects, the stench issuing from the three points of the compass marked thus (×) is truly

unbearable. I was not able to breathe, and feel persuaded that had I remained longer under the sheds than I did, where I could observe numerous people were at work, suffocation would have ensued. The blood-stained floors indicated that water is not so freely used as those concerned would make it appear is the case—in fact, there is not a tank in the neighbourhood capable of supplying 4 or 500 bags of water a day, and the river is too far off to admit of a constant supply being brought from thence. Towards the north the land lies very low, and it is there that the greatest nuisance exists—every description of dirt and filth is deposited there, and suffered to putrify, which must render the neighbourhood most unhealthy; nay, a strong southerly breeze must convey what cannot be considered, under any circumstances, wholesome over the best part of Intally. The late Mr. Overseer Dyson had orders, I understand, to keep an eye upon the butchers, and by no means to allow them to neglect the place as far as respected cleanliness; since his demise they have not only neglected the place but have deposited carcasses on the premises. There were I should say no less than 200 of these in a heap, which have accumulated since February; what the state of the low land will be in the monsoon, should the evil not be put down before that period, experience alone must decide.

At a short distance from this Establishment dwells a butcher, who has one part of his compound completely covered with the skulls of cows. This man thinks he has a right to do what he pleases on his own ground; but he is a pest to the neighbourhood, his name is Kulloo. I looked in at *Peer Allie's* stand

of bullocks to see if I could find any laboring under the disease which forms the present subject of inquiry. With the exception of two which appeared dull and drooping, (but which the keepers would have it were as healthy as the rest) I thought the rest were *quite free*, though they were somewhat low in flesh. These stands contained cattle for the use of the troops in the Fort ; here a Native evidently spoke truth when he said that the sickly among the number were the *first* to be led to slaughter. It is impossible to glean facts from interested parties, but this man was a Hindoo, and did not seem to be aware of any sheep having been known to die of Small Pox in this part of the Suburbs.

There were other private stands where I also saw cattle, some of them could hardly keep on their legs, and if not sold to the butchers the owners would soon have been put to the expense of having them removed to the river. The flesh of such find their way to the shops situated in the several Divisions visited by me ; and here I would observe, that *Kumia* supplies not only the Town of Calcutta, but the best part of the district, and has more indigent butchers in waiting to snatch up the refuse of the cows than birds of prey, and also Chummars or Domes, who it may be relied on, take away the flesh of animals dying natural deaths, with the view most probably to send it into the markets or villages, though the fact may not be admitted.

If permitted to offer an opinion I would respectfully beg to observe, that considering the state in which this, the most extensive slaughter-house in India, is generally kept, its locality, and the great

reason there exists for suspecting that unwholesome meat is too often introduced into our markets, European supervision would not perhaps be considered superfluous. I am aware that the State is desirous of avoiding expense, but may the Government not be persuaded to levy a small tax on every head of cattle slaughtered at *Kumia*, and other places, to meet the salary of one or two Officers who could reside on the spot, or as near to it as possible, and see that none but those actually fit for use are slaughtered. This person could improve the place, and see that it is kept clean, and visit all the *sheep folds* in the Suburbs, causing to be separated the sick from the healthy, which as I have shown is not done at present. I am aware that the office might prove one of great pecuniary gain, and that the best are liable to be tempted to do wrong, but I trust a conscientious European could be found to do justice to all concerned, and who would by no means neglect the well-being of his fellow creatures : Or the wealthy of this populous city would not perhaps object to the establishment of a properly organized slaughter-house *on the river side*, such as they have at Acra, if *Peer Allee* refused or neglected to render his place such as it should be. His rates of slaughtering are as follows : For the best conditioned cow three annas ; for inferior animals 1-6 pie; calves at 2-6, and sheep and goats 6 pie each.

I next proceeded to Chitpore via Sealdah,—there are no shops at the latter place, but at " Narcooldanga" a slaughter house has been recently established, and one at the former, meat being hawked about by butchers from Kumia and Dum-Dum,—about sixteen

sheep are daily slaughtered at Chitpore, by a person said to be in the habit of supplying gentlemen, and consequently keeping superior cattle.

Many are falling victims to *Small Pox* and Cholera in this Thana, (Chitpore) though since the fall of rain the former disease has somewhat abated—almost every where I perceived children from six to eight years old, who had been suffering from it. There are but a few cows here now, great numbers having died a month or two ago, and two were said to have been carried to the river in the morning. I had my eyes about me, but did not meet with a single cow or bullock labouring under the disease, but was told that the disease carried off the best portion throughout the 24-Pergunnahs, a very short period ago,—a horse at Chitpore, took the pock and died.

While conversing with some Natives I learnt that whenever salted fish (especially the hilsa) has been brought from *Furreedpore*, the Cholera has been known to be most prevalent, a circumstance not unworthy of consideration. That such is sold at *Chitla Haut*, I am pretty sure, for a Furreedpore Fish Merchant was himself attacked at that place not long since, and died on the spot. I have myself witnessed the flesh of *deer*, in the worst stage of decomposition, exported from the Soonderbuns, and exposed for sale at *Chitla*,—of this too Natives are particularly fond, and many probably fall victims to Cholera through eating it. Another circumstance was brought to my notice which I cannot pass over, since the abuse which it exposes prevails almost every where: It frequently happens, that boats laden with rice often sink, which, if recovered, is sold to the best advantage; this

rice, from having soaked for days, becomes fermented, and consequently cannot be good or eatable, it is notwithstanding ground, and made into cakes, to which is applied *Goor*, or inferior treacle, commonly used for hookah tobacco, and then cooked in the worst description of mustard oil. These cakes are of the size of a quarter plate, hard, and heavy, and as a couple satisfies hunger, the poor prefer them to the more clean but expensive confectionary of the country. They are called *malpooas*, and are of a brown colour. *Dholpoorees* too are known to cause sickness, and with the above are pretty largely sold. I had a confectioner, or rather a "*Moira*," (for he said he was not professionally a confectioner,) come to me, and found among other things a number of *malpooas* and *dholpoorees* in his wooden platter. He admitted that they had not been prepared by him nor did they belong to him, but that he had them for commission sale. The Natives he knew were afraid to use malpooas, because they were injurious, but what could he do; if sold they brought him in a few pice! One standing by observed, "did you not sell some to a person the other day and advise him to drink water after he had eaten them, which instantly brought on looseness."

Understanding that there were shops at *Tolligunge*, Thana Tazerat, I proceeded in that direction to-day and found that here also *Kumia* butchers were to be met with. There were a few shops open containing the usual description of beef, (mutton appeared to be used by the Shazadas only, of which I saw one shop) and I learnt from one of the commission agents, that Kumia Kill-khana this time last year used

to send twelve cows per diem for the use of six shops at Tolligunge, whereas it now only sends three (or four) in consequence of beef not being in much requisition. I trust I have not been remiss in my inquiries as to whether there are any who sell the meat of animals dying a natural death; none have been *detected* in doing so; but it is alleged that animals in the last stage of existence have been brought on carts to butcher's houses and there killed.

Other establishments of equal importance to the subject of inquiry exist in this district, I allude to the collection of milk by Gow-alas hired from almost every village, for making the butter which is generally used by Europeans, and for butter-milk and *tire*, both which are largely used by Natives. It is questionable whether a Native depending solely on the sale of his milk will tell the Gow-alas' collector that his cow is sick and should not be milked, and also, whether the hired servant, and equally so his master, cares whether the milk is from a healthy or sick cow.

Annexed is a Statement containing the names of butchers, situation of their shops and other information, which I hope will prove satisfactory.

(Signed) J. FLOYD,

Table shewing the result of the inquiry instituted by order of the Magistrate into the state and price of Meat sold in the Suburb Thanas of 24-Pergunnahs' Slaughter Houses, where situated, and other particulars. April, 1844.

Thanas.	Butchers' Shops where situated.	Names of Proprietors.	Number of Cows slaughtered per week last year at this time.	Calves.	Sheep.	Goats.	Kids.	Number of Cows slaughtered per week at the present time.	Calves.	Sheep.	Goats.	Kids.	Price of each description of Meat last year.	Ditto at present.	Remarks.
Nowhazaree,	Kidderpore, ...	Peerbux Cassy,.....	0	0	8	0	0	0	0	8	0	0	Per Seer. 3 Annas,	Per Seer, 3 Annas,	Mutton pretty good, sells no beef.
Ditto,.....	Ditto, ...	Jummun Cassy,.....	8	0	0	0	0	8	0	0	0	0	1 Anna,	1 do.,	Slaughter house very filthy, containing one cow evidently healthy, none had been slaughtered here this day.
Ditto,.....	Allipnagur, ...	Ayrip ditto,	4 to 8	0	0	0	0	4 to 8	0	0	0	0	1 ditto,	1 ditto,	Shop closed.
Ditto,.....	Burtulla, ...	Bundoo do.,	8	0	0	0	0	8	0	0	0	0	1 ditto,	1 do.,	Good, slaughter house filthy.*
Ditto,.....	Ditto, ...	Jummun do.,	8	0	0	0	0	8	0	0	0	0	1 ditto,	1 ditto,	Inferior, ditto ditto.
Ditto,.....	Ramchundeepore,	Surrubdee ditto, ...	8	0	0	0	0	8	0	0	0	0	.....	2 Pice,	Very bad, ditto ditto.*
Manictulla,	Armanee Bazar,	Peer Allie do.,	2100	350	170	40	0	1400	340	170	40	0	Not sold	here,	State of this establishment will be found described in Report accompanying.

* The cows in these places appeared free from disease.

Thanas.	Butchers' Shops where situated.	Names of Proprietors.	Number of Cows slaughtered per week last year at this time.	Calves.	Sheep.	Goats.	Kids.	Number of Cows slaughtered per week at the present time.	Calves.	Sheep.	Goats.	Kids.	Price of each description of Meat last year.	Ditto at present.	Remarks.
Chitpore,	Road to Barenagore, ...	Closed, and the proprietor absent,	0	0	0	0	0	0	0	0	0	0			
Tazerat, ...	Talligunge, ...	Bhowaroo Shaik,...	0	0	0	0	0	0	0	14	0	0	.....	3 Annas,	Supplies the Mysore Priuees.
Ditto,.....	Ditto, ...	Five shops conducted by Gurreebola and others. The sixth has been abandoned,.....	84	0	0	0	0	About 21	0	0	0	0	1 Anna,	1 Anna,	Receive their supply of inferior meat from Peer Allie's slaughter house at Kurrya or Armanee Bazar.

(Signed) J. FLOYD.

In connection with this subject Dr. W. B. O'Shaughnessey writes to me,—

"I regret that it is not in my power to give you any accurate information regarding the *abattoir* establishments in New York and Paris. I did not visit those in New York, but I was informed by my friend Dr. Hosack, that the Municipal Authorities of that City had made the best possible arrangements for preventing the future occurrence of the casaulties described in his most valuable paper.

"I am perfectly satisfied that the diseased condition of cattle so ably elucidated by Dr. Hosack, is not the only one which causes dangerous and *fatal maladies* in the consumers of the infected meat. In the American diseases it is especially important to notice too that salting or smoking does not destroy, or even weaken the poison.

"The only mode in which the public can be protected from this formidable danger is by the establishment of public slaughter-houses under trustworthy inspectors. It is not only the special and peculiar train of symptoms induced by poisonous meat that we have to guard against, but the much more important class of casualties in which Epidemic maladies, such as Cholera and Dysentery, are excited by the poisonous food. I cannot doubt but that many of those appalling cases in which whole families are swept off in a few hours by Cholera could be traced to this exciting cause.

"I am very happy to find you have taken up the subject—you will prove yourself a great benefactor to the European community of Calcutta, should your

exertions succeed in placing the supply of animal food under the requisite system of inspection.

(Signed) W. B. O'SHAUGHNESSY.

PART III.

VACCINATION IN BENGAL.

In a brief and local Memoir like the present it would be superfluous to repeat what is already perfectly well known to every one regarding the early introduction of the Jennerian Antidote into India by the circuitous route of Vienna, Constantinople, Bagdad, Bussora and Bombay, however inviting the narrative and curious its details.

Yet in writing on such a subject as vaccination, and from Calcutta one may be pardoned the indulgence of a little national pride in the reflection, that to English skill and science the world is indebted for the discovery, the elucidation, and the triumphant establishment of two of the most important laws of the animal economy, viz. those relating to the circulation of the blood, and the prophylactic power of vaccination, —results of patient philosophic research which perhaps more than any other in modern times have conduced to the extended happiness of mankind, and which certainly have mainly helped to raise the Healing Art to its present high estimation and usefulness in the East, and tended to elevate it to the long denied place, it is destined one day to hold among the Exact Sciences.

Shoolbred's Report for 1804.—The earliest official "Report" on the progress of Vaccine Inoculation in Bengal is that of Dr. Shoolbred, published by order of Government in 1805, which gives an abstract of the number of patients vaccinated at the principal and subordinate stations during the preceding year. The total, including Prince of Wales' Island and Fort Marlborough, was 8,140: Of this number 1,426 were successfully punctured in Calcutta; 1,422 in Dacca; 3,121 at Patna; 776 at Moorshedabad; and 467 at Monghyr.

At these places Dr. Shoolbred remarks "it will be admitted that enough has been done, not only to secure a constant source of fresh virus, but even to render the new practice of considerable benefit to the inhabitants. If at Benares, Allahabad, Cawnpore, and Furruckabad, the success of the new practice has not been proportionate, I trust I shall be able to satisfy the Board, that the cause of such deficiency is not to be found in any want of zeal, attention or activity, on the part of the Superintendents at these stations, but in the existence of obstacles, both natural and artificial, which no industry or exertion, however well directed, could be expected at once to overcome." He proceeds to enumerate these, and states as the principal causes of failure in the Bengal Provinces,—1st, the extreme difficulty of keeping up the disease in a very high temperature, even when inoculating with recent fluid matter from subject to subject—2dly the apathy and indifference of the Native character; and 3dly, the avowed hostility of the whole body of Native Small Pox Inoculators. So greatly did these obstacles interfere with the spread of vaccination in

the Upper Provinces that the disease was entirely lost at Allahabad on the 20th of April 1804, and nearly at the same time at Benares, Cawnpore, Gorruckpore and Furruckabad. To all these stations it was found impossible to restore the disease during the hot weather, or by the usual means of transmitting the matter. They were at length, however, again put in possession of the virus at Furruckabad in October, at Cawnpore in November, at Benares and Allahabad not till January, by means of *the dried scab* after all other methods of transmission had repeatedly failed.

The volume furnishes ample testimony to the virtue of the prophylactic throughout Bengal, in those in whom it took effect. Mr. McNabb, of Patna, writes in March 1805—"Out of the large number I have myself vaccinated at this station, the greater part have been exposed in various ways to the variolous infection, and there has not occurred among the whole a single instance of Small Pox taking effect afterwards." His observations regarding the effect of season on the course of Small Pox, accord with those to be found in the preceding part of this Memoir. "I have repeatedly observed when the Small Pox has been raging in the city with the utmost violence, that its progress was invariably checked on the commencement of the hot winds, and when these continued to blow regularly for a few weeks, the contagion has at last been entirely extinguished." Notwithstanding the hostility of the Small Pox Inoculators, Mr. McNabb felt sanguine that he "should get the better of these, and of every other obstacle in the course of a year or two, and that the Small Pox inoculation will be gradually left off."

Similar accounts of the causes of the loss of the disease, and its restoration in the cold weather are given by Mr. Yeld, of Benares, Mr. Gibb of Allahabad, Mr. Kegan of Chuprah, Mr. Wyatt of Mozufferpore, Mr. Cooke of Sylhet, and others.

The most important part of this interesting Memoir perhaps is that relating to the success of the method of transmitting vaccine virus to distant stations, without impairment, by means of *the dry scab*, the knowledge of which renders every other method unnecessary. "It was not till September or October last, says Dr. Shoolbred, that I became acquainted with this valuable property of the vaccine scab. I then first saw the treatise by Mr. Bryce of Edinburgh, who has the merit of first introducing us to the knowledge of this useful discovery. I immediately made trial of it and found that by means of a scab nearly a month old, from the time of its dropping from the arm, I succeeded nearly as well as with recent fluid lymph."

The testimonies given to the efficiency of this method are numerous, and Dr. Shoolbred concludes by saying, "The discovery of the preservative quality of the scab must therefore be considered as a circumstance of the greatest importance to the future progress of vaccination, leaving nothing further to be desired on the very delicate and difficult subject of preserving the virus and transmitting it to distant places."

Among other plans suggested by Dr. Shoolbred to conciliate the opposition of the Small Pox Inoculators, was that of engaging "a certain number of the most considerable among them to practice vaccine instead

of Small Pox inoculation. Having assembled a number of them at the Native Hospital, and explained to them the nature and terms of the proposed engagement, and the measures he wished them to pursue with the view of introducing the vaccine inoculation among the Native inhabitants of Calcutta, he undertook to instruct two of the principal inoculators in the art, and their progress was so rapid that they were soon allowed to practice on their own families, and some of their neighbours, keeping registers in a prescribed form to show that the disease had gone through its regular course. This permission was gradually extended to others, and a considerable number were enlisted expressly for the purpose of disseminating the knowledge and practice of vaccination among their townsmen. While in this spirit of amity to the new practice, it fortunately happened that an opportunity occurred of proving to them, in the most decisive manner, the complete protective power of the vaccine disease by experiments conducted by themselves at the Native Hospital. An account of these experiments was drawn up in the Native language, and subsequently printed, which the inoculators all very readily signed as well those who were now in paid employ agreeably to the plan above mentioned, as several others spontaneously, twenty-six in number, together with a declaration thereto affixed of their full conviction of the ante-variolous power of the vaccine disease, of its entire freedom from danger, and, what is perhaps of greater consequence in this country to its progress, that they were not aware of any circumstance which should render its adoption improper by any rank of Hindoos." The original of

this document which was signed in the presence of Mr. Blacquiere, the then Chief Magistrate, is still in his possession. Of the men who signed it, (all persons of high caste and consideration) only one now survives, receiving a pension of 26 Rupees a month from Government. His sons however, and those of some of the others, adopting as in duty bound, the new creed of their fathers, are now the principal Vaccinators of my Establishment. To the conciliatory firmness of Dr. Shoolbred, to the evident disinterestedness of his proceedings, to their publicity, as well as to his very high character among all classes as a benevolent and skilful Surgeon, must be ascribed the great success of vaccination at that time in Calcutta, and the almost magic conversion of the bigotted worshippers of *Seetula* to a new faith.

Another measure, not mentioned in his Report, was adopted in Calcutta the same year, of which Mr. Blacquiere has given me an account. This was the prohibition by the Magistrates, at the desire of the Maquis Wellesley, of Small Pox Inoculation *within the town limits.* All persons desirous to have their children inoculated for Small Pox in the old way, were required to remove out of town for the purpose, and were not permitted to re-enter it with their families for two months.

As the observance however of this rule was not made compulsory by any law more cogent than a Police Regulation, it was not very long submitted to, and gradually sank into neglect. Yet as there is now no doubt that the Small Pox is annually introduced into Calcutta by a set of inoculators, numbering about 30, to the great endangerment of public health,

the re-enactment of the Regulation would appear to be as advisable as it will be easy both in Calcutta and all the great Cities of Bengal. The inconvenience occasioned by it would induce many to forego the proscribed practice, and to adopt the safer and easier alternative; while no religious prejudice would be wounded.

Dr. Cameron's Report for 1829.—The next "Report on Vaccination in Bengal," published by authority, is that of Dr. W. Cameron in 1831, which contains a tabular "General Abstract of the number of persons vaccinated at the principal and subordinate Depots, from the year 1818 to 1829 inclusive." I have not been able to find any account of those vaccinated during the preceding intermediate years.

From this statement it would appear that the remedy had somewhat advanced in public opinion, exhibiting as it does a considerable increase in the number of subjects vaccinated at particular stations, though certainly by no means what was to be expected. Thus at Calcutta the number vaccinated in 1829, is stated to be no more than 2,102, at Dacca 3,139, at Patna 2,357, at Moorshedabad 7,223, at Monghyr 2,076.

The Report itself seems to have been "called for in consequence of rumors which prevailed unfavorable to the practice of vaccination during the prevalence of the Epidemic Small Pox which ravaged the Western Provinces in the preceding year, and which induced the Medical Board to call upon the Medical Staff to furnish such information as they possessed relative to the efficacy of vaccination, as a preventive of the disease." The replies received were made over

to the Superintendent General, and are published at full length in the Appendix. A summary of the information therein contained will here suffice.

From these accounts it appeared that the Small Pox was a much more prevalent and fatal disease in many of the Western Provinces than had at all been supposed. In the *Saugor* Division, Mr. Campbell (the Superintending Surgeon) states that it is to be met with, every year to a greater or less extent, frequently in several districts remote from each other at the same time. It had raged with greatest violence lately at Gurrawarrah, Seonee, Jubbulpore, and Bhopal; but what was remarkable was, that "many places where it had prevailed in past seasons have been completely free from its visitation this year." With respect to the security afforded by vaccination he states that "it is only among the children of Native Officers and Sepoys at Military stations, that it was practicable to carry the practice to any extent, but no account is given of the specific character of the disease, of its course, or the tests of efficiency to which it was subjected. The Small Pox itself is described as of a most virulent form, setting in with delirium, which usually preceded the eruption, the patients generally dying on the fifth or sixth day. Many were cut off with suffocation, in consequence of violent inflammation and ulceration of the throat: children and infants were frequently carried off before the eruption took place. The disease generally made its appearance in February, or early in March, became more violent as the heat increased, and gradually disappeared as the temperature diminished with the setting in of the rains. Before the

middle of June the disease had almost always entirely disappeared.

In the *Sirhind* Division, Mr. Thomson (Superintending Surgeon,) reported that the Small Pox had prevailed extensively in Kurnaul, Hansi, and Loodianah, in the months of February, March and April ; It became more mild in May, and disappeared in June, the worst cases occurred among children of Native Soldiers and others who had never been vaccinated, but cases of modified Small Pox after vaccination were numerous. At Loodianah there was great anxiety evinced for the antidote. Dr. Murray states that numbers of people came to him to have their children vaccinated from the Punjab, and from places 40 miles distant, where Small Pox was prevailing ; and applications for supplies of vaccine matter were made to him from Lahore and Amritser.

From *Sabathoo* Mr. Gerard gives some interesting particulars regarding Small Pox and Vaccination. " Of the former, it is a notorious fact that both the virulence and contagious properties are aggravated by cold, and the ratio of mortality is infinitely greater when the Epidemic occurs in the winter season. Variolous inoculation is only practised during seasons of great mortality; the people are accustomed to abandon those attacked with the disease to their fate. Among the fatal cases which occurred in the town were several succeeding vaccination, when there was no apparent reason to suspect the efficiency of the operation." But he speaks from personal observation of many cases of supposed failure of vaccination which was clearly attributable to the existence of chronic cutaneous disease at the time. Of the vacci-

nated cases which were afterwards affected with Small Pox, he observes that several were operated on under circumstances which made it more than doubtful that the system had been previously vitiated by Small Pox infection, and "it is astonishing how long antecedent to visible symptoms, the germs of the disease sometimes linger in the constitution." Again, "in all cases of this nature the progress of the vaccine visicle was never uniform, nor its character perfect. And upon the natural supervention of Small Pox the *vaccine pustules* ceased to advance to its usual maturity, yet remained distinct, evidently showing that the affection was purely local."

In some cases of long standing vaccination which were supplanted by Small Pox, the history of the infection could not be traced. In many the cicatrix on both arms was well developed, in others small or even wanting. In the generality "a very marked amelioration of symptoms was visible, and a much milder form of Small Pox was produced. In others, recently arrived from Kemaoon, no modification of the disease was observable, and they mostly all proved fatal." Of these cases he remarks, "it is probable that the operation was ineffectual either by exciting only a purely local injection, or by decay of the virus producing a spurious effect." During the course of the Epidemic he was obliged to discontinue vaccination, finding that the climate (at least in part of May and June) was against its success, several cases being instantly superceded by Small Pox.

Mr. Gerard speaks very favorably of the climate of the hills and the character of the mountain tribes as suitable to the propagation of "the most perfect

vaccine," except in the heavy rains; but laments the scattered and thin population, and mentions among other causes of frequent failure the necessity of woollen clothing in that cold climate, by which the vesicles are often broken and the virtues of the prophylactic destroyed; indeed, besides the occasional disappointment upon the supervention of Small Pox after vaccination, and a natural misgiving of the efficacy of so mild an antidote to so severe a malady, the greatest obstacle in the way of success was in the "difficulty of making the inhabitants appreciate the necessity of precaution during the progress of vaccination."

The Reports from *Neemuch* and other Western Provinces are not so favorable in regard of climate, and enumerate the same difficulties in the way of vaccination. In *Mehrwarrah* (a tract of country 80 miles in length by about 12 in breadth, thinly peopled,) Mr. McLean writes that Small Pox prevails *annually* in the months of March, April and May ; that by far the greater number of persons attacked are under 10 years of age,—that of these nearly one-third perish—that the disease is more fatal to adults—that inoculation is unknown—and no medical treatment whatever is resorted to—vaccination is confined to the Soldiery and the Servants of Government.

At *Cawnpore*, the Superintending Surgeon reported in March 1830, that during the then prevalence of Small Pox many Natives, "not in the Service," had shown a more than usual disposition to avail themselves of the advantages of vaccination. "Unfortunately at this season the experience of past years has shown that the lymph is *wholly inert* in this climate."

The Small Pox he states to be principally confined to the Natives, 57 eases having been admitted into Hospital during February, Mareh and April, of which nine proved fatal. The disease had hardly any existence among the European Soldiers, but of their wives and ehildren many were attaeked, all of whom were *supposed* to be vaeeinated, and one-half of those died of the disease in a eonfluent form. "Of the eases which oeeurred among Offieers, all had been seeured by vaeeination in early life." He mentions a remarkable eireumstance, "Small Pox inoeulation is either unknown or not at all praetised in Allahabad." Vaeeination was not in repute; but a very interesting ease of modified Small Pox having oeeurred in the person of Mr. Connolly, the Colleetor, in which the ineursive stages were uncommonly severe, attended with delirium and vomiting, and an unexpeeted and sudden amelioration took plaee upon the oeeurrence of the eruption, proving the benign influence of the Jennerian antidote, he found that the benefieial effects of vaeeination had not passed unobserved by the Native Hukeems.

At *Benares*, Mr. Limond reported that Small Pox had prevailed in the eity during the months of April and May, but he had not heard of any person affected with the disease having been previously vaccinated.

At *Dinapore*, Dr. French, H. M. 49th Foot, had sueceeded in effectually putting a stop to the spread of Small Pox in his Regiment by extensive re-vaeeination. A marked difference was observable in those who were born and vaecinated in India, from those who had been vaecinated in their youth in England. In the latter, the general eharacter of the disease was

that of modified Small Pox, whereas all the fatal cases were found among those born and vaccinated in this country.

From *Allahabad*, Mr. Guthrie writes, that "Small Pox, from time immemorial, seems to have been one of the allotted scourges of Hindostan. It appears annually to set in as an Epidemic in the cold weather, and continues till the rainy season, prevailing from November to July."

Its peculiar violence and fatality in 1830, he attributed to the prevalence of unusual easterly winds; and great irregularity of the atmosphere, together with a general failure of the crops, and the depreciated food of a dense population.

Mr. Cameron concludes his Report in the following words—

"On reviewing the whole of these letters in reply "to the enquiries of the Medical Board of Bengal "relative to Vaccination, modified Small Pox, "Variola recurring after Small Pox, and the Epide- "mic Variola of 1829-30, there does not appear to be "one well authenticated case of variola supervening "on perfect vaccination, provided the progress has "been carefully and perfectly conducted on a healthy "subject. I think under these circumstances we may "conclude that Vaccination is as good an antidote "against Small Pox in Bengal as the same process "*cæteris paribus* performed in any other country where "this valuable discovery is known."

Present state of Vaccination in Bengal.—After the lapse of so many years, it becomes desirable to pause and inquire how all these untoward and perturbing influences have affected the spread, the estimation,

and the efficiency of the vaccine lymph amid the diversified circumstances of locality, climate, and population which the wide expanse of the British Indian Empire embraces. Anxiety is every where felt to learn how far the antidote is now deserving of confidence; how the genuine or spurious character of the lymph is determined; what provision is made, what precautions are necessary to preserve from impairment the qualities of the lymph; what preparation or state of body is proper for its reception; what steps are essential to its success, particularly in the choice of season for operating, the conduct of the operation, the subsequent management of the subject; what is ascertained relative to the durability of the protection afforded by early vaccination; how is this found to be affected by advance of life, by change of climate, and place, by occurrence of disease, by exposure to concentrated Epidemic influences; is it possible to renew the protection by re-vaccination at certain intervals when this power has been lost; and finally what has been done to regenerate the virus itself and to obtain when needed fresh supplies of unexceptionable lymph from the natural and original source the cow, or from distant climates where its maintenance is easy and its efficiency certain.

On all these professional points it must be confessed that not much information can be at present given, for very little has been here added to what was already known. Neither has there, I regret to say, been much progress made in National Vaccination. The same antipathy exists to the innovation, the same apathy to distant and uncertain ills, the same chicanery among the agents employed, and until lately no

rational or well considered attempt has been made to overcome these difficulties, while the evils of indiscriminate vaccination throughout the whole year are still permitted to exist, and Small Pox inoculation is practised without check or hindrance in every village.

Variola Vaccina of Moorshedabad.—The only event of professional importance connected with vaccination which has occurred during the last thirteen years, has been the discovery by Dr. McPherson of Moorshedabad, of the genuine Cow Pox among some cattle in that town in 1832, and his successful employment and distribution of this lymph throughout India.

For this discovery Dr. McPherson received the thanks of the Court of Directors, and has earned those of the profession. An account of his interesting investigations being now to be found in every *Manual*, it is unnecessary here to detail them at length ; Yet without seeking in the remotest manner to detract from his merits, I must express my frequent regret that his information was not given more fully regarding the appearances of the disease in the cow from which he took the crusts, one of which succeeded. Notwithstanding also the "jealousy with which his operations were watched by the Natives," I can scarcely hold him fairly excused for not using the fresh lymph itself from the pustules which arose upon *his own* cows, instead of waiting till these had dried into crusts. We miss too a more detailed account of the progress of the vesicles into pustules and crusts, seeing how important such a description would prove to future investigators. Other reflections involuntarily force themselves upon me, but these I will not

here dwell upon believing that Dr. McPherson's own very hurried account of the solitary successful case, from the single saved crust, must be sufficiently suggestive of them, to all who have had much dealings with the Natives of India. The following is the passage I refer to. "The disease assumed the cha- "racter of an Epidemic; all the cattle in the neigh- "bourhood became affected, and amongst others two "belonging to one of my own Vaccinators. I had "them covered with blankets, leaving the udder and "teats exposed to the air. On the 7th day, two "small pustules made their appearance on the teats "of one, which dried upon the 10th, and the crusts "were removed on the 12th day.

"From these crusts eleven Native children were "inoculated; no effects whatever were produced on "six of this number; two had very slight inflamma- "tion on the arms on the 3d and 5th days; two "had considerable local inflamation and slight heat "of surface on the 5th, 6th and 7th days, but no "vesicle formed, though there was marked induration "round the punctures. The remaining child's arm "was slightly inflamed on the 4th morning and a "vesicle was apparent the next day, which continued "to increase till the 9th day, when I was much gra- "tified to find that it assumed all the characteristics "of the Vaccine Disease."

The superiority of the lymph derived from this source was proved beyond doubt, and the Natives appeared to place greater confidence in it; for the number of applicants for vaccination during the next three months exceeded that of any similar period for several years. Charges were distributed widely all

over the country and to Calcutta, where it was speedily mixed up with that previously in use.

Variola Vaccina of Assam.—The next event in the order of interest and importance in the professional history of Vaccination is the supposed discovery of a genuine Cow Pox in Assam, by Messrs. Brown and Furnell. An interesting narration of their investigations appeared in the Quarterly Journal of the Calcutta Medical Society for April 1837. An account is first given of the epizootic malady which then prevailed with great mortality, and which differs not much from that described by Dr. McPherson at Moorshedabad, and in the preceding part of this Memoir in Calcutta

Encouraged by Dr. McPherson's success and undeterred by any apprehensions which subsequent experience painfully, though too late, excited, these gentlemen made use of some scales or scabs taken from the back or abdomen of a cow affected with *Mattah*, reducing them to a pulp with water, with which Mr. Brown inoculated four children. "In all "four, vesicles in every respect resembling in their "progress, and when mature, genuine *vaccinia* made "their appearance and went through the same re-"gular course; the constitutional disturbance on the "8th day only being more severe than I have usually "seen it in the latter." From these, many other Native children were inoculated and no doubts of the genuineness of the lymph were excited until two English children were punctured from one of them, and it was then found that Small Pox supervened in both of these cases; and this was more than suspected to have happened in many of the Native children

who had generally dispersed a few days after the operation and were not afterwards heard of. The parents very probably considered this eruption when it occurred a legitimate sequence of the operation. One of these English children unhappily died, and Mr. Brown concludes a truly ingenuous and valuable account of the whole experiments in the following words :

"Were I inclined to speculate on this deeply interesting subject I might venture to say with all diffidence, that the experiments of Mr. Furnell and myself as far as they go, would lead to the belief that the virus of *Mattah* was of a compound nature, and produced in our hands two diseases, the one of a decidedly vesicular character, and resembling in our opinion genuine Vaccinia ; the second of a variolous nature and resembling modified Small Pox, which in turn caused a similar eruption in a vaccinated individual. Should such occurrences hereafter be confirmed by others they would tend to authorize the hypothesis entertained by some, that Variola and Vaccinia are resolvable into one common malady, and derivable from one common virus."

So distressing a casualty as that above narrated and so disastrous results of experiments taught caution in inquiring, but did not suppress the desire for investigation. Attempts were made to repeat the interesting experiments of Dr. Sonderland of Bremen by many Medical men in all parts of the country, but without success. My predecessor Dr. A. R. Jackson, Mr. Lamb, of Dacca, and I believe many others, have also inoculated cows with Small Pox matter, over and over, but in vain. I have already mentioned my own want of success in inoculating

with Small Pox matter after the manner advised and successfully practised in England by Mr. Ceely, under the most favorable circumstances. Notwithstanding these disappointments the interest felt on this subject by the profession throughout India is very general, and I cannot allow myself to doubt that some one more fortunate than myself will ere long achieve this great desideratum, and demonstrate the possibility in India of effecting what has been done elsewhere, viz. to transfer the human Small Pox by some means or other to the cow, and setting up in that animal the genuine Cow Pox, restore from thence to the human subject, the virulent fluid he parted with, now robbed of its poisonous essence, and charged with beneficent, qualities, and wondrous unique and novel virtues.*

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* NOTE.—Not having seen the following narrative noticed in any of the Periodicals of last year its publication in this place may be useful. It is taken from the Annual Report of the Royal Jennerian Vaccine Institution for 1843, page 16.

"The attenion of all interested in Vaccination is earnestly called to the following valuable document, which will demonstrate, GENUINE VACCINE exist in SOUTH AMERICA, and which also affords a beautiful corroborative evidence, in the description of the vaccine as presented in Buenos Ayres, of the perfection of Jenner's description; and also of this fact, that the vaccine vesicle, like as each CHEMICAL compound, has the same ATOMIC constitution in all parts of the world, has the same character, in whatever part of the world presented."

(Signed) J. EPPS, Medical Director.

Province of Buenos Ayres, Villa de Lujan, Jan. 20, 1842.

SIR,—I have the honour to inform you, that the pustule from the cow, preservative against the Small Pox in the human kind, has been extracted from one of the said animals in the department of which I am Vaccine administrator. The documents, or vouchers of the extractions, and the application of the genuine humour, to 46 persons of different

English Supply.—One of my first endeavours on taking charge of the Department in Calcutta was to obtain from England, or elsewhere, a fresh supply of genuine and unexceptionable lymph, to replace the

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parishes, ages, sex, and contrary constitutions, and even to adult persons, have been delivered to the administrator-general for vaccination in the capital.

The pustule, (which I must be allowed to call secondary or of transmission, and which exempts us from the variolic contagion,) has shown in all the persons, who were vaccinated, its natural peculiarities, with the exception, that in three-fourths of them, the eruption of small pustules in several parts of the body was very notable, as well as the pain in the limbs, the increase of the feverish symptoms, and the tumefaction of the glands of the axilla, as well as of the neck.

Proofs, Sir, have been multiplied. The administrator-general, who so wisely and with great zeal rules over the central establishment, has made experiments with some crusts which I forwarded to him. There, as well as every where, the experiments have had the most happy and complete results.

It is now a fact that the Cow-Pox, like that obtained from the cows at Gloucester, where the discoveries of the IMMORTAL JENNER were tried, exists also in the cows of this country. Not only is that protective virus to be found in that county of the old world, and in the country near to the capital of the Argentine state ; but even it has been found in equinoctial America, though, to this day, nobody has experienced that extraordinary peculiarity of the virus of the cows amongst us, or, if it has been the case, it has not been made public, nor can they give so many evident proofs as in the present instance.

As it is already 20 years since I have dedicated my researches upon the variolic irruption in the cow, (though never with to much benefit as in my last attempt,) I can assert, that it is not the same as that produced by the humour dropped from the *ranilla*, a horse malady, known in this country under the name of *mal del Bazo*, and by the French, *eaux aux jambes*..

If, as is affirmed by several authors, the Cow-Pox does not spread, but through the contact of hands with those persons who have them already, while milking, impregnated with the humour or serosity pro-

then existing virus, which with exception of the lymph introduced from Moorshedabad, was the same which had been propagated from subject to subject *ab initio* in 1802, and which had proved at times by no means satisfactory. Other reasons induced me much to desire a change.

Character of the Vaccine in Bengal.—A great variation is observed in Bengal in the character of the vesicle and the quality of the lymph, attendant on the course of the seasons. This was so great in 1837 as to excite much anxiety, (and this indeed has recurred almost every rainy season from May to September) lest the prophylactic should be entirely lost. The vesicles at this time become extremely minute, the surrounding induration small, the areola diffuse and ill-defined, the course of the disease hurried and

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dueed by that horse malady, it would result, (as the eruption through the effluvia or emanation is not eonveyed from one eow to another,) that it would not be known in this provinee, nor in almost all America, nor in a great part of the world. Amongst us, as well as on the continent, the eare of milking the eows is entirely eonfided to the women, who never eome in contact with any horse, suffering from the aforesaid malady. We have no farriers in this eountry who can eure the said malady, which eonsequently is, with few exceptions, entirely left to take its eourse, and it ean be affirmed that any quack, who may chance to make use of some empiric medicaments for the eure of said malady, never milks a cow. Besides, in the five cases under observation in eonnexion with Cow-Pox, in no one has the least suspicion of eontagion been entertained on that seore : with the idea therefore of removing all repugnance, the state of horses belonging to dairies and farms where there were eows with the disease, have been very minutely and attentively investigated. More has still been done—all the mares in the environs have been examined, so as to remove the least suspicion of a fortuitous and singular eontaet, and nothing has been diseovered of such a thing, and still less of the malady of EAUX AUX JAMBES.

unsatisfactory. Yet strange to say notwithstanding these unfavorable appearances, I have observed them uniformly to disappear on the approach of cool weather, and the disease resumes speedily in the

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We think proper to observe, that, though dampness in the ground, and freshness in the grass, are required for the appearance of Cow-Pox in this country, properly speaking, it is not so much required in our province. This present year, for instance, that drought and its effects have been manifest to every man, (from the 1st of May, the time in which the winter rains begin to fall, till the end of September, we have had only six light showers,) we have had the pleasure to discover the Cow-Pox produced also in this district. In the year 1831, which was one of the most doleful recorded in the history of this country, while in the north of the country above two millions of cattle (*vacuno*) died, the Cow-Pox was however discovered by us in the month of January, but, unfortunately, while I was preparing to have the crusts removed from the animal, a very severe hurricane arose, which lasted two days, and covered the atmosphere with a very dense and suffocating dust: the cow disappeared with many more, and I had the sorrow to lose the object, which I so carefully had been watching over.

I believe that any season of the year is proper for the appearance, or the development of the pox in the cow, though I should think, according to my own observations, that August, September, and October, being spring months, and in which parturition amongst the cows generally takes place, are the best.

I have been unable to watch the first period, called infection; I have therefore (after the second period, or eruption has begun) been obliged for describing it, to abide by the observations made previous: my observations showed the animal, while in that state, to be dull and without appetite, the secretion of the milk is diminished, the eyes appear glassy, and are much inflamed: it avoids the society of other animals, and makes a confused noise with the tongue and lips: this state continues for four days.

During the second period, which is the eruptive, small pustulus appear in a circular line near the border of the teat, or its junction with the hairy part, which envolves the udder; the number varies from two to three on each teat, though they do not always appear on the four teats; between the teats, and sometimes over the body of the animal, some pimples appear, which, in some particular cases, extend over the whole

month of November, the perfectly developed Jennerian character.

In September 1839, I received by the Overland Mail in forty days from England a supply of Vaccine lymph on points and glasses, also four excellent vaccine crusts put up for me with great care in a small

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of the udder ; the teats become swollen, and get shorter ; on the udder, many hard and painful spots appear, which are as so many irritated glands : the figure or shape of the crusts is round and flattened, and have a small hollow in the centre, called umbilical : a shade of very light purple colour, which increases in extent till the maturation begins, when it forms a disk, surrounds the crusts.

As soon as the animal enters the second period, it becomes in a continual state of irritability. It does not allow sufficient suction for its nourishment to its breed. If tied for milking, as soon as it feels the pressure of the rough hand of the milk woman, it begins kicking and becomes very unruly. Then, as it is vulgarly said, it becomes mad, and must be let loose, which means, that it must not be milked till that feverish and painful period is overcome.

The eruption terminates generally four days from the beginning. The animal recovers then its wonted appetite and cheerfulness.

The maturation of the small pustules, which constitutes the third period, terminates at the fourth or fifth day from the eruption. By this time they have attained their full size. The liquor in them, from being transparent, becomes of a whitish silver colour. The cow, then, though in appearance getting better of the revolution experienced in her system while depurating herself from a virus, *specifically elaborated in her own organs,* or while the suffering through its action, if it is projected in the general circulation by external causes, is subject to a very great sensibility in the teats, and even on the udder.

Fourth period, Desiccation.—The humour contained in the pustules loses its limpidness, and becomes of a greyish yellow colour attaining at last a kind of reddish colour, then it thickens, and becomes, on the eleventh or twelfth day, perfectly consolidated.

The crusts, which were of a leaden colour, by this time begin to darken, and to lose their cellular form, in proportion as they attain compactedness. Their diameter gets reduced in as much as the humour in their cavity becomes concreted. Their surface is not so smooth as

tin soldered case by Dr. Gilham, of the National Vaccine Institution. From this source, but chiefly from the crusts, a new stock was set up, which if not superior to that previously in use was preferable on various accounts. Before commencing to distribute it I was careful to take the opinion of several of my professional brethren as to its authenticity and to test this by a variety of methods. The result being perfectly satisfactory, the old stock was allowed entirely to subside, and was replaced by this, which is that now in use all over Bengal. Reporting this event to the Medical Board in January 1841, I stated that "the peculiarities which I note in the new stock as compared with the old one are—1st, The latent period intervening between the performance of the operation and the developement of its specific effects is much longer, extending from three to six days before the puncture begins to inflame at all, and during this period, so inert has the virus frequently appeared that parents have frequently reported its total failure in cases which, so late as the 7th and even 8th day, have budded and progressed to great perfection. 2dly. The vesicles are larger and

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that of the human Vaccine; it is rugose and rough, though it always preserves the central depression characteristical to said erpution.

Being apprehensive of losing the crusts of my last labours, I separated them on the thirteenth day, while they were yet strongly attached, and in their place great wounds came out.

The animals will not allow their young to suckle till the crusts have fallen off. The least touch on those hard tubercles gives them a very sharp pain, and they become wild and dangerous.—The Lord preserve your life many years.

FRANCISCO JAVIER MUNIZ,

Police Doctor and Administrator of Vaccination in the Department of Buenos Ayres.

more globular; they contain clearer lymph and more of it, their disk is more exact and circular, and the central depression exists from the first. 3d. The areola is uniformly much larger and broader, and in European children the colour, firmness, &c., are strictly Jennerian. 4th. The constitutional fever is considerable on the 8th or 9th day, and even when not so, is always well marked. 5th. The course of the disease altogether is slower, more deliberate (if I may say so) than was the case generally with the old one. The vesicles often do not begin to become opaque till the 10th or 11th day, and the crusts never fall off before the 13th or 14th day. 6th. In no single case has any secondary rash arisen, nor have any other untoward circumstances occurred.

"I have great pleasure in stating that similar results to those above quoted, have been obligingly reported to me as arising from the charges of new lymph and crusts to many of the Mofussil stations from Herat* to Moulmein, excepting Meerut, from which place I have not yet been favored with any report.

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* NOTE.—My friend Dr. J. S. Login, who was the companion of the brave Pottinger during the long siege of Herat, writes to me lately as follows, from Lucknow:

"You wish for some particulars regarding my success as a Medical practitioner, and vaccinator at Herat. The fact is, I am sorry to say, I can communicate but very little on that subject, for before I could get all my arrangements completed for carrying my plans into full effect, and establishing an Hospital and Vaccination permanently in that quarter, the misunderstanding with *Yar Mahomed* took place which led to our departure. This was a great disappointment to me. On our march from Herat to Candahar I had the further mortification of meeting your supplies of vaccine matter by every other *cossid*. Still I had vaccinated many at Herat, and successfully, and had pointed out

"During the three past years, particularly at certain holiday seasons, and during the hot weather and rains, I have experienced much difficulty in keeping up what I could consider a healthy and genuine Pock. The charges of lymph taken in June, July, and August, have almost invariably failed, and I have occasionally been obliged to defer, forwarding any supply until September or later, the cold weather appearing to be by far the most favorable time for propagating the virus in Bengal."

At a later date I thought it proper in support of the character I had given of the new lymph, to forward to the Medical Board, the following letters and extracts from correspondence relative thereto.

From Mr. J. McLennan, Superintendant of Vaccination, Bombay, dated 15th March, 1841.

"In *Natives* on this side of India, the vesicles, and consequently the scabs are, generally speaking, a good deal smaller than in children of *European parents*, in whom the appearance of the disease is precisely similar to what is observed in England.

"I have in two successive years remarked the periodical alteration in the characteristics of the vaccine

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its advantages, and instructed a man there how to operate, &c., but whether he continued it or not after our departure I am unable to say.

"With respect to professional practice generally I enjoyed very ample opportunities at that place of doing a little good, and making known the superiority of modern Medical science practically among the Turcomans, and Khorassanees, who readily and fully appreciated this. But I am ashamed to say that I took no notes of any cases, having in truth my time so much occupied, and my hands full of all sorts of other work, besides my Medical duties. However, I confess this ought to be no excuse," &c.

to which you allude. In Bombay, it has invariably occurred in the hot months of April, May, and June, and not in the rains, at which season and in the cold months it was as perfect as we ever see it. I may in reference to this copy your own words and say that "it invariably seems to decline in force, and certainly alters in appearance during the hot weather, but though not renewed, it gains strength and the true Jennerian characteristics in the cold months."

"In the hot weather the proportion of failures to successfully vaccinated is very great, and I at one or two periods have been apprehensive that the disease might be lost. On reference to the records in office, however, I find that the experience of my predecessor accords with yours, and that in the rains of 1837, '"at the commencement of the monsoon the vesicle was observed in all the subjects vaccinated to be considerably smaller than usual, (about one half) and it continued to exhibit this decreased size without any other alteration in its character throughout the monsoon, but on the setting in of the cold weather the eruption resumed its ordinary appearance."' In the letter reporting this circumstance to the Superintending Surgeon, Assistant Surgeon Hiddle, then in the charge of the Superintendency of Vaccination, makes a remark that a "degeneration or irregularity in the external character of the vaccine vesicle is known to occur here usually during the rains, but never to the extent recently observed."

From Mr. Smith, Assistant Surgeon, Mysore, 7th August, 1841.

"The supplies of lymph despatched on the 19th June, answered perfectly. The pustules, however,

are not much larger than the ones we already have.

"Matter taken from a small pustule in a Native and one that by no means appeared satisfactory, has almost invariably produced in the *European child* a perfectly formed large and healthy vesicle."

From Mr. Crommelin, Sylhet, 8th July, 1841.

"The lymph sent by you, said to be from the crusts from England, answered remarkably well."

From Mr. Furnell, Assam, 17th June, 1841.

"The vesicle and scab ran their course with the greatest regularity, and I have not the slightest doubt of the vaccine being genuine.

"I trust, I may now be enabled to keep up the disease. I have forwarded supplies to Dr. Arnott, at Debroogur, also this day to Saikwa and Jeypore."

From Mr. Assistant Surgeon Sinclair, H. M.'s 62d, Hazareebaugh, 10th May, 1841.

"Almost every individual instance of the operation proved most satisfactory, I have now vaccinated the entire number of children belonging to Soldiers of this Regiment.

"The only observation I have to make of the present lymph is that the pustules seemed later in coming forward, the principal progress being observed on the 7th or 8th day; on the 9th day they were all fit to have lymph taken from them to vaccinate others."

From Mr. Gordon, Civil Surgeon, Mirzapore, 6th May, 1841.

" Difficulty in finding subject in succession,—successfully vaccinated several children."

From Mr. Playfair, Superintending Surgeon, Meerut, 15th April, 1841.

" Having at length succeeded in establishing a most satisfactory vaccine disease at this station, there will be no further occasion for supplies of virus from the Presidency."

From Mr. Beattie, Civil Assist. Surgeon, Allahabad, 8th April, 1841.

" At last I have been able to establish the vaccine in a very satisfactory form; but not one out of hundreds vaccinated before the 25th ultimo, proved successful."

From Mr. Dicken, Civil Surgeon, Balasore, 24th March, 1841.

" The pustule produced by your last lymph resembled the form of disease met with in England, more than any I have been accustomed to see in this country. It is larger, fuller, and has a more perfect areola."

From Dr. J. Mellis, Superintending Surgeon, Neemuch, 24th April, 1841.

" I have much pleasure in forwarding a few of the very satisfactory reports I have received in reply to a Circular of mine regarding the superior quality of

the vaccine virus you have been sending me for some months past, and I am happy to add that out of 302 cases of children from one to ten years of age vaccinated at the Agency Joudpore, from 1st to 31st March, no less than 292 succeeded in the most favorable manner."

From Dr. A. Duncun, Medical Store Keeper, Neemuch, 18th April, 1841.

"The vaccine virus lately received from Dr. Stewart, of Calcutta, seems to possess more genuine character than any I have hitherto met with in India.

"The vesicle appears in general between the 6th and 12th day after the operation, it is distinctly cellular, with depressed centre, and filled with transparent clear lymph. The areola is large, vivid, and well defined; some degree of febrile excitement generally occurs during the progress of the affection."

From Mr. Assist. Surgeon Dollard, 7th N. I., Neemuch, 16th April, 1841.

"In all my cases the lymph succeeded most satisfactorily. I may mention that in three cases I had previously twice failed.

"I am decidedly of opinion that the lymph at present supplied is superior to what we had formerly."

From Mr. Assist. Surgeon Strover, 11th N. I., Neemuch, 19th April, 1841.

"I have vaccinated the children of the Regiment from the lymph obtained from Calcutta, it succeeded remarkably well, the whole of them being well developed on the 8th day.

" I should certainly say that this lymph is as pure as it is possible to be.

From Mr. Stiven, Offg. Supg. Surgeon, Agra, 8th May, 1841.

" It affords me much pleasure to intimate to you that all the children belonging to H. M.'s 31st Regt. have been now satisfactorily vaccinated from your last supply.

" I trust the disease will now be maintained for some time, although the atmospherical influence now would seem to militate against the expectation."

From Mr. Butter, Civil Surgeon, Benares, 2d April, 1841.

" I have now quite satisfied myself that I have established a genuine vaccine disease here from the supply with which you furnished me on the 29th December, and am able to supply the demand at Bareilly, Saugor, Soobathoo, &c. The work is going on well."

From Mr. Jas. Steel, C. A. Surgeon, Soobathoo, 4th January, 1841.

" We succeeded perfectly with your first supply. The pustule produced is good and exhibits all the characters of the most genuine vaccine pock"

From Mr. Assist. Surgeon Russel, Ajmere, 2d January, 1841.

" The disease has appeared so genuine that I have distributed portions of the lymyh to several Medical Officers in the neighbourhood."

Re-vaccination and Inoculation.—It remains to state the opinion of the Profession upon the lymph at present in use in Calcutta. In order to satisfy myself of its purity I am in the habit of using Bryce's test upon five or six individuals every month, but the alleged occurrence lately of several cases of Small Pox, after vaccination in Calcutta, induced me this season to test its virtue by the *experimentum crusis*—Inoculation with Small Pox matter. I had great difficulty in prevailing upon any persons to submit to this; only six subjects could be found, two of these were sons of Takoordoss Paul, one of my oldest Brahmin Vaccinators, who in the hope of succeeding some day to the honor of becoming "Company's Servants," consented to the trial, not without apprehensions. The operation was performed by a Native practitioner of inoculation in my presence, by making a multitude of stabs with a stiletto in a small circle in each arm; and in order more fully to satisfy the spectators, I insisted on the business being done in the regular way, not omitting a single incantation or charm; Owing to the severity of the process I was not surprised to find a good deal of inflammation ensue on the following day, and subsequently suppuration of the wounds, but they healed up not having produced the slightest constitutional disturbance in any case. One of these subjects was aged 17, another 21, a third aged 12, and two were about 9 years old; all had been vaccinated when very young. A Native Durzee brought his infant, aged three months, to the Park Street Dispensary, for vaccination on the 10th January, on whom it succeeded very well. On proposing to him to make security doubly

sure by afterwards having his child inoculated he replied very naively "What use? has not the Small Pox been destroying numbers in every house in my Tannah, nay in my own very house and bed, and have not my other three children who were all vaccinated in this room, and by this very man, escaped entirely? No, no! I am quite satisfied." I nevertheless prevailed on him to submit one of his boys to the test, and was gratified to find the security perfect. I took care to let all my proceedings in these cases be done as publicly as possible—this boy was seven years old.

I had less difficulty in obtaining subjects for revaccination, and propose every year in future to repeat such trials, and ascertain as far as possible, the duration of the protection given in this country, and after what lapse of time susceptibility is renewed.

Among the European society there have occurred not a few cases this year of modified Small Pox, in persons of adult age, who had been vaccinated in England in early life, and very many have been revaccinated with complete success.

The following instance occurred in my own practice: Mr. J. C., æt. 39, was vaccinated in London in early infancy, retained four enormous marks on the arms, pitted as with a wafer stamp, not less in size than a six pence. Calling one day in January at my house when I was engaged in operating he bethought himself of renewing his protection, and was accordingly punctured in two places on one arm; on the 3d day very slight irritation was perceived in the part which thereafter daily increased until, on the 10th and 11th day, the areola had extended from about

three inches above the puncture to the elbow. The glands of the axilla partook of the irritation and were swelled and painful, the constitutional disturbance for a day or two was considerable; no varioloid or other eruption appeared, and the affection subsided slowly and regularly. On the 6th day, Dr. Garden requested leave to take lymph from one of the vesicles, and vaccinated several children of a neighbouring family, in one of whom (previously unprotected) it rose normally and well: in the others no effect was produced, save slight redness and itching on the day following the operation, satisfactorily proving the efficiency of their previous vaccination.

The following Table gives the results of 87 cases of Natives re-vaccinated under my own inspection, exhibiting five successful cases only. In the others there was no effect at all produced, or only a slight redness, inflammation and suppuration of the part which passed off in the course of three or four days.

TABLE G.

Shewing the Results of Re-vaccination in 87 *Cases.*

Age when first Vaccinated.	Number.	Age when Re-Vaccinated.	Number.	Remarks.	Age when first Vaccinated.	Number.	Age when Re-Vaccinated.	Number.	Remarks.
Under 1 Year,	11	8 yrs.,	1	Failed.	Brot. forward	...	.....	11	
		11 „	1	ditto.	1 Year, ...	23	11 yrs.	2	Failed.
		17 „	1	ditto.			12 „	2	ditto.
		26 „	2	ditto.			13 „	1	ditto.
		27 „	1	ditto.			14 „	2	ditto.
		28 „	1	ditto.			15 „	3	ditto.
		30 „	1	Successful.			16 „	2	ditto.
		31 „	1	ditto.			18 „	1	ditto.
							20 „	4	ditto.
		32 „	1	4 tolerably good vesicles.					Successful.
							21 „	1	
		34 „	1	Failed.					
Carried over,	...	.....	11		Carried over,	...	.....	29	

TABLE G.—*Continued.*

Age when first Vaccinated.	Number.	Age when Re-Vaccinated.	Number.	Remarks.	Age when first Vaccinated.	Number.	Age when Re-Vaccinated.	Number.	Remarks.
Brot. forward,	...	.....	29		Brot. forward	...	.....	65	Failed.
1 Year,.....		25 yrs.,	2	Failed.	4 Years, ...		21 yrs.,	1	„
		30 „	1	ditto.	5 Years, ...	7	7 „	1	„
		33 „	1	ditto.			13 „	1	„
		37 „	1	Successful.			21 „	2	„
2 Years,.....	16	7 „	1	Failed.			23 „	1	„
		9 „	2	ditto.			25 „	1	„
		10 „	2	ditto.					„
		14 „	1	ditto.			32 „	1	Successful.
		16 „	2	ditto.					
		18 „	3	ditto.	6 Years, ...	2	22 „	1	„
		19 „	3	ditto.			30 „	1	„
		21 „	1	ditto.	7 Years, ...	5	12 „	1	„
		43 „	1	ditto.			20 „	1	„
3 Years,.....	10	9 „	1	ditto.			22 „	1	„
		12 „	1	ditto.			30 „	1	„
		14 „	1	ditto.			32 „	1	„
		17 „	2	ditto.	8 Years, ...	3	17 „	1	„
		18 „	1	ditto.			24 „	1	„
		20 „	1	ditto.			32 „	1	„
		22 „	1	ditto.	9 Years, ...	1	13 „	1	„
		24 „	1	ditto.	10 Years, ...	1	17 „	1	„
		26 „	1	ditto.	11 Years, ...	1	15 „	1	„
4 Years, ...	6	15 „	1	ditto.	19 Years, ...	1	27 „	1	„
		17 „	1	ditto.					
		18 „	1	ditto.	Total,...	87		87	
		19 „	1	ditto.					
		20 „	1	ditto.					
Carried over,	...	.....	65						

I am happy to say that the opinions given by all my professional friends in reply to Query 5th are unanimously favorable to the qualities of the present lymph. One gentleman states that it is "fully equal, and the areola with the vesicle, which is produced from it, are as perfect and as satisfactory as I have ever seen in England. In this respect I consider the Vaccine now in use superior to that made use of some years ago. The cold season and the months of February and March are the best for its practice."

The replies to Query 7th are too contradictory to be quoted. No two gentlemen in fact appear to have made up their minds on the point, and it still remains an interesting question for further investigation. The general belief however seems to be that the constitution becomes altered alike by change of climate, severe illness, and advance of life, so as to induce a fresh susceptibility to Small Pox such as had at first existed.

Native estimation of Vaccination.—I have every reason from my own observation to believe that the prophylactic is in good and increasing repute among all classes of Natives in Calcutta. I am confirmed in this opinion by the testimony of Baboo Russomoy Dutt, who tells me in reply to my inquiries on this head, that " he has observed the progress of Native opinion regarding it for the last 25 years, and has practiced it successfully in his own family for 12 years. The enlightened portion of the Hindoo community and the lower classes hold vaccination in the highest estimation at present ; but a great majority of the *middle class* still adhere to the original system of inoculation, instigated at least as much by the influence of superstition and the persuasion of Native " Tikadars," as by a belief of its efficacy. Small Pox Inoculation is certainly however not so common as formerly. During the late Epidemic and previous ones, Vaccination proved in my own family a complete protection, while Small Pox prevailed all around. I have known some instances of parties not being so exempted, but in these cases the disease in no case terminated fatally and was of the mildest kind."

Mr. Blacquiere's report is not so favorable ; he says he has " been conversant with vaccination ever since

its introduction into Calcutta in 1802. It is not in such estimation now as at that period; the Natives not having equal confidence in its protective powers. This is attributable to failures which have occurred, particularly during the present year.

Small Pox Inocculation is as common as ever. A Cubburaz (a Native practitioner of Physic) informs me that he has inoculated 600 patients this year."

Antiquity of Inoculation.—My obliging friend Ramapersaud Roy (son of the illustrious Rammohun Roy) has furnished me with a mass of Sanscrit papers, extracts from the antient *Hindoo* Shasters, with translations, abundantly illustrative of the minuteness of their acquaintance with the symptoms, progress, varieties, and terminations of Small Pox in olden times—and the multitude and variety of the remedies then in use.

The only passages in his communications of any interest however are the following, which prove their familiarity with the practice of Inoculation as a preventive or mollifier of Small Pox.

"In conclusion the author recommends Inoculation, as the best remedy and antidote for the infection of this disease, and directs that the operation of inoculation of males should be made in the right and of females on the left arm. The concluding Stanza "নারীণাং বামপার্শ্বস্থং নরাণা মপসব্যশং। পাপরোগ ভয়ং দরাত্ শিবাস্থি বিনিবারয়েত্।" may be translated thus—"should woman bear inoculation শিবাস্থি on the left side, and man on the right, then there shall be no danger from bushunt (Small Pox.") It is to be observed however that in this Stanza the word "শিবাস্থি" and not "টিকা" is used. The former

term is now become obsolete and this is perhaps the only instance where it is used, and according to the interpretation of the learned, with reference to the circumstances of the case under notice no other meaning but *inoculation* can be attached to it. The word "টিকা" is derived from the Sanscrit root "টিক" to move, and literally means the transporting of a thing from one place to another. In common acceptance the word "টিকা" is used to mean the act of transference. It also means the circular sign which the Hindoos are accustomed to impress on their forehead on certain ceremonial occasions. The Nidan, from which the above extracts have been made, does not contain a dissertation on Inoculation, it only treats of the disease when naturally developed on the human body. A treatise on the art of Inoculation however is contained in the Tuntras, a cotemporaneous work with the Nidan. I have not been able to procure a copy of the former, but as soon as I can lay my hand on one, I will send you a translation of the chapter which treats on this subject. I find no allusion to vaccination any where, nor any to the diseases of cows. It is impossible to ascertain, from the want of dates in the works themselves, the exact period at which they were written. I am however inclined to date these works at the time when Menoo wrote his celebrated work on Jurisprudence."

The following Table H. compiled from the Records of the Medical Board, gives a view of the progress of Vaccination throughout Bengal, from 1827, the date of Mr. Cameron's Report, to the present time.

TABLE H.

Showing the number of Persons Vaccinated in every year from 1827 *to* 1843 *inclusive, at each Vaccine Station in Bengal and the North Western Provinces.*

BARRACKPORE DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Calcutta,.....	2327	2135	3675	2102	2793	3205	3425	2096	920	1479	4951	7267	5058	6546	6671	8138	10988
Beerbhoom, ...	0	0	0	0	0	0	0	0	0	0	115	125	172	370	361	439	405
Burdwan, ...	0	0	0	0	0	0	0	0	0	0	124	172	148	335	392	891	1020
Balessore, ...	0	0	0	0	0	0	0	0	0	5	8	0	1	48	43	22	14
Bauleah,.....	0	0	0	0	0	0	0	0	0	381	543	1189	1255	1022	732	1092	1003
Cuttack,.....	1715	1735	2565	3125	0	0	0	0	0	133	151	147	79	287	509	827	1463
Dinagepore, ...	0	0	0	0	0	0	0	0	0	24	166	252	255	330	226	366	428
Hooghley, ...	0	0	0	0	0	0	0	0	0	370	769	458	776	856	902	859	852
Howrah,.....	0	0	0	0	0	0	0	0	0	0	300	389	416	359	414	453	461
Jessore, ...	0	0	0	0	0	0	0	0	0	0	260	493	724	545	705	719	704
Kishnaghur, ...	0	0	0	0	0	0	0	0	0	240	324	188	218	396	318	473	586
Maldah, ...	0	0	0	0	0	0	0	0	0	53	78	453	517	484	576	841	1121
Midnapore, ...	0	0	0	0	0	0	0	0	0	20	2704	107	214	549	563	2990	6445
Moorshedabad, ...	4183	4277	491	7223	4208	1957	7337	3524	3010	4577	338	3143	3800	5192	2958	3019	3757
Pooree, ...	0	0	0	0	0	0	0	0	0	72	278	360	114	146	101	97	109
Rungpore,.....	0	1352	3251	3095	0	0	0	0	0	127	978	332	254	384	309	252	230
Dum-Dum, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinsurah,.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noacolly, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
Totals,.....	8225	9499	9982	15545	7001	5162	10762	5620	3930	7481	12087	15075	14001	17855	15780	21478	29585

DACCA DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Dacca, ...	1510	2350	2703	3139	2521	2797	2512	1942	3254	4650	3924	509	561	315	915	2003	3490
Sylhet, ...	0	0	0	0	0	0	0	0	0	0	1315	1250	1391	1625	499	1564	1483
Pubnah, ...	0	0	0	0	0	0	0	0	0	0	0	0	168	271	251	498	230
Backergunge, ...	0	0	0	0	0	0	0	0	0	0	146	124	78	87	44	89	118
Mymensing, ...	0	0	0	0	0	0	0	0	0	190	105	311	355	327	198	326	431
Bullooah, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tipperah, ...	0	0	0	0	0	0	0	0	0	692	3176	459	178	177	234	789	162
Furreedpore, ...	0	0	0	0	0	0	0	0	0	99	245	231	191	393	190	173	259
Chittagong, ...	2990	4391	4961	7523	0	0	0	0	0	112	422	1897	1566	1560	1177	1880	2428
Gowhatty, ...	0	0	0	0	0	0	0	0	0	137	80	675	44	0	0	27	0
Goalparah, ...	0	0	0	0	0	0	0	0	0	0	27	91	79	52	14	25	120
Akyab, ...	0	0	0	0	0	0	0	0	0	0	9	0	39	202	1804	158	0
Seebsaugur, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	656
Totals, ...	4500	6741	7664	10662	2521	2797	2512	1942	3254	5880	9869	5547	4550	5009	5328	7532	9377

DINAPORE DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Patnah, ...	2369	1649	2742	2357	2238	3030	4622	3560	2312	1953	73	2801	2553	2086	6795	5961	5939
Chyabassa,.....	0	0	0	0	0	0	0	0	0	0	0	0	0	240	402	236	0
Goyah, ...	0	0	0	0	0	0	0	0	0	0	76	419	744	762	590	781	698
Sheergotty, ...	0	0	0	0	0	0	0	0	0	0	53	441	385	368	306	410	375
Bhaugulpore, ...	1425	1046	1535	2338	0	0	0	0	0	81	354	20	5	310	232	253	272
Monghyr, ...	2137	2995	2777	2076	0	0	0	0	0	58	135	145	94	449	348	301	193
Teerhoot, ...	0	0	0	0	0	0	0	0	0	141	398	1215	1005	10207	1524	1951	1221
Arrah, ...	0	0	0	0	0	0	0	0	0	0	42	25	61	308	314	189	173
Saurun, ...	0	0	0	9	0	0	0	0	0	225	248	260	266	250	216	201	296
Hazarcebaugh, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	130	290	0	0
Kishenpore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	0	0
Doorandah, ...	0	0	0	0	0	0	0	0	0	0	149	43	28	0	143	715	2085
Darjeeling, ...	0	0	0	0	0	0	0	0	0	0	0	0.	0	0	245	217	277
Purneah, ...	0	0	0	0	0	0	0	0	0	0	17	0	77	84	0	0	0
Totals,.....	5931	5690	7054	6771	2238	3030	4622	3560	2312	2458	1545	5369	5218	15230	11405	9215	11529

BENARES DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Benares,.....	649	556	569	633	6587	1168	1413	1439	1052	914	816	457	696	1483	956	1129	1444
Ghazeepore, ...	0	0	0	0	0	0	0	0	0	0	256	182	258	146	279	301	458
Goruckpore, ...	0	0	0	0	0	0	0	0	0	0	82	0	0	6	150	144	210
Juanpore, ...	0	0	0	0	0	0	0	0	0	0	231	63	16	35	109	150	431
Mirzapore,.....	0	0	0	0	0	0	0	0	0	0	33	12	0	0	0	16	26
Chunar, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	30	12	20	21
Totals,.....	649	556	569	633	6587	1168	1413	1439	1052	914	1418	714	970	1700	1506	1758	2590

CAWNPORE DIVISION.

Allahabad, ...	420	1029	836	836	0	0	0	0	0	130	86	21	44	324	345	359	269
Cawnpore, ...	1186	2018	1352	1186	0	0	0	0	0	45	190	133	136	113	251	231	686
Howalbaugh,.....	0	0	0	0	0	0	0	0	0	0	1086	0	0	0	0	0	0
Futtyghur, ...	0	0	0	0	0	0	0	0	0	0	166	43	9	428	388	423	228
Etawah, ...	0	0	0	0	0	0	0	0	0	101	0	0	3	0	0	0	39
Mynpooree, ...	0	0	0	0	0	0	0	0	0	70	43	11	0	0	0	483	1024
Futtypore,.....	0	0	0	0	0	9	0	0	0	147	261	91	51	216	220	182	167
Azimghur,.....	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0
Bandah, ...	0	0	0	0	0	0	0	0	0	81	63	0	9	40	0	40	80
Lucknow, ...	1532	1741	651	93	0	0	0	0	0	0	0	0	0	0	24	0	0
Totals, ...	3138	4788	2839	2115	0	0	0	0	0	574	1901	299	252	1121	1228	1718	2493

MEERUT DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Badaoon, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0
Meerutt,.....	0	514	592	599	0	0	0	0	0	0	177	164	10	68	109	118	224
Delhi,.....	603	619	507	677	0	0	0	0	0	53	314	70	45	345	176	534	408
Barielly,.....	1529	1432	1915	2126	1916	1888	1582	1353	1495	2568	1977	1703	2019	1856	2357	1543	1260
Mooradabad,.....	0	0	0	0	0	0	0	0	0	361	361	349	281	643	411	524	517
Shajehanpore, ...	0	0	0	0	0	0	0	0	0	0	377	834	557	1092	1330	489	1383
Shaharunpore, ...	0	0	0	0	0	0	0	0	0	1155	498	425	230	271	303	108	168
Bidgnore, ...	0	0	0	0	0	0	0	0	0	778	648	1069	270	523	599	506	604
Landour, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0
Mozuffernaghur, ...	0	0	0	0	0	0	0	0	0	240	35	29	0	61	149	137	79
Almorah, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Totals, ...	2132	2565	3014	3402	1916	1888	1582	1353	1495	4155	4387	4643	3412	4873	5452	3959	4647

AGRA DIVISION.

Agrah, ...	863	952	969	1003	0	0	0	0	0	0	121	171	9	111	76	218	142
Allygurh, ...	0	0	0	0	0	0	0	0	0	193	475	296	20	160	485	672	1205
Bolundsuhur, ...	0	0	0	0	0	0	0	0	0	29	307	306	0	234	504	328	597
Muttra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	332
Totals, ...	863	952	969	1003	0	0	0	0	0	222	903	773	29	505	1065	1218	2276

KURNAUL DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Kurnaul, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	0
Hissar, ...	0	0	0	0	0	0	0	0	0	0	38	46	28	180	198	180	260
Ambolah, ...	0	0	0	0	0	0	0	0	0	0	0	125	0	133	1376	657	472
Subathoo, ...	0	823	595	565	1131	1074	0	0	0	390	4714	8333	1221	3121	4988	3939	4830
Hansie, ...	0	0	0	0	0	0	0	0	0	0	44	116	126	225	227	50	88
Ferozepore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Totals,.....	0	823	595	565	1131	1074	0	0	0	390	4796	8620	1375	3659	6789	4879	5655

SAUGUR DIVISION.

Seonee, ...	0	0	0	0	0	0	0	0	0	34	885	43	3	0	0	0	4
Jubbulpore, ...	0	0	0	0	0	0	0	0	0	43	44	0	0	0	9	0	78
Saugore, ...	0	0	0	0	0	0	0	0	0	226	436	111	114	52	19	0	0
Hussingabad,.....	0	0	0	0	0	0	0	0	0	456	16	0	0	0	38	0	0
Baitool, ...	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Totals,.....	0	0	0	0	0	0	0	0	0	759	1381	157	117	52	66	0	82

NEEMUCH DIVISION.

Stations.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Mundlaisir, ...	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0
Neemuch, ...	0	0	0	0	0	0	0	0	0	0	100	191	300	176	300	254	209
Ajmere, ...	0	362	363	386	0	0	0	0	0	0	125	70	15	84	222	386	237
Bewar, ...	0	0	0	0	0	0	0	0	0	0	93	0	0	0	50	0	0
Nusseerabad,.....	0	0	0	0	0	0	0	0	0	0	40	46	0	6	0	10	0
Mhow, ...	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0
Kamaoon, ...	0	0	0	0	0	0	0	0	0	0	0	496	0	0	0	0	0
Banslah,.....	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0
Humeerpore,.....	0	0	0	0	0	0	0	0	0	0	41	26	11	0	0	0	0
Azimghur,.....	0	0	0	0	0	0	0	0	0	0	0	42	0	0	0	0	0
Kotah, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Furrakabad, ...	1030	721	1147	621	0	0	0	0	0	0	0	0	0	0	0	0	0
Hyderabad, ...	674	911	1078	1421	0	0	0	0	0	0	0	0	0	0	0	0	0
Naugpore,.....	4369	16874	13777	15040	0	0	0	0	0	0	0	0	0	0	0	0	0
Rajpootna,.....	1288	2574	1898	897	0	0	0	0	0	0	0	0	0	0	0	0	0
Sumbulpore,.....	2364	2393	1820	2849	0	0	0	0	0	0	0	0	0	0	0	0	0
Garrow Hill,.....	2795	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals,.....	12520	23835	20083	21214	0	0	0	0	0	0	419	923	326	266	592	754	446

TOTAL OF EACH DIVISION.

Divisions.	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843
Barrackpore Divn.,	8225	9499	9982	15545	7001	5162	10762	5620	3930	7481	12087	15075	14001	17855	15780	21478	29585
Dacca ditto, ...	4500	6741	7664	10662	2521	2797	2512	1942	3254	5880	9869	5547	4550	5009	5328	7532	9377
Dinapore ditto,.....	5931	5690	7054	6771	2238	3030	4622	3560	2312	2458	1545	5369	5218	15230	11405	9215	11529
Benares ditto, ...	649	556	569	633	6587	1168	1413	1439	1052	914	1418	714	970	1700	1506	1758	2590
Cawnpore ditto,.....	3138	4788	2839	2115	0	0	0	0	0	574	1901	299	252	1121	1228	1718	2493
Meerut ditto, ...	2132	2565	3014	3402	1916	1888	1582	1353	1495	4155	4387	4643	3412	4873	5452	3959	4647
Agra ditto, ...	863	952	969	1003	0	0	0	0	0	222	903	773	29	505	1065	1218	2276
Kurnaul ditto, ...	0	823	595	565	1131	1074	0	0	0	390	4796	8620	1375	3659	6789	4879	5655
Saugur ditto, ...	0	0	0	0	0	0	0	0	0	759	1381	157	117	52	66	0	82
Neemuch ditto,.....	12520	23835	20083	21214	0	0	0	0	0	0	419	923	326	266	592	754	446
Totals,.....	37958	60449	52769	61910	21394	15119	20891	13914	12043	22836	38706	42120	30250	50270	49211	52511	68680

Government Vaccine Establishments.—There are no large Vaccine Establishments in India unconnected with the State, such as there are in London, and many other cities of England, and elsewhere. It is a remarkable circumstance in the History of Vaccination that the great public duty of maintaining its purity and disseminating its blessings seems from the first moment of its discovery to have been at once felt, acknowledged, and acted on by every civilized Government; as if all were simultaneously impressed with a sense of the equal claim of all their subjects to the benefits of this newly bestowed gift of a beneficent Providence, as freely as to the general light of heaven; and as if all became at once aware of the manifold risks of its neglect, and even the dangers which might accrue from leaving the charge of such a treasure to the wilful caprice, and thoughtless culture of the unthinking multitude, which alas still constitutes the majority of mankind, and considered the duty of promoting vaccination as much imperative upon the Government, as the maintenance of Quarantine Laws.

At a very early period after the discovery, some of the more despotic States of Europe enacted, that all children born within their dominions be vaccinated. Princes and Ministers of State we are told in Russia were instructed in the performance of the operation, and practised it among their vassals and dependents.

In England, where, thanks to a free press and general education, the advantages of the remedy were speedily known and estimated both by rich and poor all over the land, no such extreme measure as compulsory vaccination has ever been proposed.

In the Parliamentary Debates on the subject in 1807, Mr. Wilberforce observed that "the object was not to *force* vaccine inoculation, but to impose certain rules on those who practised Small Pox inoculation, in order that the public might be secured from the effects of that contagion, as is done in the case of the plague."

"These suggestions however," says Dr. Baron, "were not relished by the house; just and moderate though they were, they seemed to have too much the aspect of compulsion; and the liberty of doing wrong was still left among the privileges of free-born Englishmen."

That the British Indian Government participated in these views, may be supposed from the incidental fact previously mentioned in this Memoir, of the failure of the Marquis Wellesley's attempt in 1805, to banish Small Pox inoculation beyond the Mahratta Ditch; but if in this instance, the Indian Government may, by some, be considered to have evinced a somewhat blameable degree of toleration for the prejudices and usages of their ignorant subjects, assuredly no Government has been more liberal in its encouragement of the remedy, or more assiduously desirous to promote its diffusion among the millions committed to their care.

It is also gratifying to think that the British Public in India were among the first to evince in substantial form their gratitude to the benevolent discoverer of vaccination. In May 1806, a present of £4,000 was transmitted to Dr. Jenner from "the principal inhabitants of Calcutta and its dependencies, as a testimonial of their gratitude for the benefits, which this Settlement in common with the rest of

mankind, has derived from his inestimable discovery of a preventive of the Small Pox." The example was speedily followed by Bombay and Madras, the former community transmitting shortly after £2,000, and the latter £1,383-1-10.

From the evidence afforded by the accompanying Financial Table I. it appears that within the Presidencies of Bengal, Madras and Bombay, and in the North Western Provinces, from the first introduction of vaccination in 1803-4 to 1835-6, a period of thirty-two years—the large sum of 16 lacs of Rupees (Rupees 1,642,369) has been expended from the revenues of the State in the maintenance of a Vaccine Establishment. In 1828, no less a sum than Rupees 81,538 was the expenditure on this account in the Bengal Presidency alone. In 1831, the expenditure in the Madras Presidency amounted to Rupees 69,538 ; at Bombay the annual expenditure has never exceeded Rupees 51,592. At the present time I believe the total annual expenditure throughout India, on account of vaccination, amounts to about a lac of Rupees. How far the annual grant, from this sum, of 40,000 Rupees is well bestowed in Bengal may be gathered from a comparison of the numbers reported in the Table H. as vaccinated in 1843—viz. 68,680, with those in 1828—viz. 60,449 at double the cost. As far as reliance may be placed on the Returns there exhibited the actual average cost to the State of each subject successfully vaccinated in Bengal at the present time is about nine annas and three pice (that is, we may suppose one shilling and two pence) whereas according to a recorded calculation of Lord William Bentinck's in 1832, "in the course

of the 14 previous years not more than 4¼ lacs of persons had been punctured; and these at a cost of nearly two Rupees 4 Annas a head." The actual number now vaccinated is considerably larger, and the cost of each just one-fourth.*

Under these circumstances surely there is abundant evidence to show that, though but little has yet been done in Bengal, considering its enormous population, and much remains undone, there has at least been no want of liberality or of suitable exertion on the part of Government in promoting the blessings of vaccination; and there exists no reasonable ground for the charge sometimes heedlessly cast upon the Medical Authorities here of remissness in their enforcement of all authorised measures for this purpose, though the results be in some respects not so satisfactory as could be wished.

Those who indulge, at the distance of half the globe in such reflections, are but little aware of the manifold obstacles both of natural and *constituted* origin which every effort to promote any popular movement in India has to encounter, however obvious and unquestionable its expediency, and its apparent practicability.

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* By the Vaccine Extension Act of 1840, payment to Medical Practitioners in England for Vaccination was directed to be made at a stipulated average sum of 1*s.* 6*d.* for each successful case; and it appears from a return in the Ninth Report of the Poor Law Commissioners that the fees paid to Vaccinators under that Act for the year 1843, amounted to £33,104, giving an average of 1*s.* 9*d.* for each of 378,331 persons vaccinated. Dr. George Gregory speaks with satisfaction of the working of this Act; through the operation of which he says that "the practice of vaccination is now extending rapidly through the Provinces. In the metropolis, owing to the number of well-conducted Vaccine Institutions, it had always prospered."

Moreover they are apt to overlook one circumstance which has been peculiarly unfavorable in its results upon Vaccination; I allude to the frequent, nay of late unavoidable changes in the Executive or *Secretarial* Department of the Bengal Medical Board; and to the successively varying constitution of the Boards at all the Indian Presidencies; the consequences of which have been great uncertainty and vacillation in the Councils and measures adopted from time to time, and as entire a want of co-operation, or almost of communication between the Boards of the several Presidencies, as if they did not exist within the same region, or under the same Supreme Government.

The following most interesting account of the Bombay Vaccine Establishment appeared in the "Lancet" some years ago, and will, I doubt not, be read with much interest in our Presidency. It is suggestive of much comment.

STATE OF VACCINATION IN THE BOMBAY PRESIDENCY.

To the Editor of The Lancet.

Sir,—As it appears to me that a detailed account of the present state of vaccination in the Bombay Presidency may not be uninteresting to many of your readers, I trust you will give a corner of your valuable periodical for the insertion of the present *precis*.

But few people probably are aware, that the Bombay Presidency is the only one of the three Presidencies in which there are surgeons whose chief and exclusive duty is the propagation of cow-pox. To be sure, in Madras and Bengal there are "superintendents general" of vaccination, under whom are civil surgeons,* at certain stations, who

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* This is a mistake, as far as Bengal is concerned. The *Office* was abolished in 1816, and the "General Superintendence" of the Department transferred to the Medical Board. The fine sounding *Title* alone remains.

(Signd.) D. S.

have a vaccinating allowance, and one or more native vaccinators under them; but there are no travelling vaccinators.

We owe our present system to the enlightened liberality of the Hon. Mountstuart Elphinstone. He saw that the system as formerly established was one not at all fitted to the wants and habits of a half-civilized and half-subdued population, however well it might be adapted for the meridian of Greenwich, and that it was absolutely necessary to the final establishment of vaccination, that it should be carried to the doors of the people—too lazy,—too poor,—or too ignorant, to come in search of it. He was well aware that the presence of a European officer thoroughly versed in the manners and habits of the natives, would do more to smooth away prejudices than the best native vaccinator. Actuated by these views he divided the whole of the territories of the Presidency into four grand divisions, and to each of these divisions he appointed a European vaccinator, with an establishment of native vaccinators under him. The European vaccinator was exempted from all local control, civil, military, or medical, and was at liberty to carry on his operations in whatever part of his district he might think proper, reporting, monthly, to the medical board at Bombay. The salary was liberal, so that the vaccinator could at any time take a rapid journey, and come suddenly on his native assistants to ascertain the fidelity of their reports, settle quarrels, &c.; and, in addition to the duties of superintending the vaccination, the vaccinator was provided with a supply of medicines and ordered to give advice and medical assistance to any of the natives who might apply to him. He was also furnished with from six to eight peons, to assist himself and his native subordinates in collecting the inhabitants, transmitting orders, procuring supplies, &c. This plan you will, I think, say was a well-devised one, calculated to be of infinite use, not only as a means of shielding the natives from the attacks of a dreadful disease, but as a means of extending among them a knowledge of the character of the British Government, showing that their rulers looked upon them in rather a higher view than that of mere living machines, created to pay taxes. They had, and still have, need of this knowledge, for even to the present day many of them never see the face of a European unless as a tax-gatherer.

That the institution has amply answered the ends proposed by its founder must be evident to any traveller. It is only to be regretted that the means of Government did not originally allow of a more extensive establishment of native vaccinators, and it is still more to be

deplored that the Government should in its late economizing policy have found it necessary to reduce the establishment still further; but of this more hereafter. Meantime I pass on to a detail of the actual working of the machine, and with a view to this I think I cannot do better than communicate the plan I have followed during the three years I have been a vaccinator. These three years having been spent in three of the four divisions abovementioned, I shall begin with Guzerat, a rich, populous, and extensive province, in length about 250 miles, and in breadth about 50, more or less. As each class of the people requires to be dealt with in its own peculiar manner, I shall first give you a slight sketch of the different classes.

The population is, towards the central and southern parts, half agricultural and half manufacturing or commercial. Towards the northern parts it is almost entirely agricultural and pastoral. Large towns in the province are numerous. I speak within bounds in saying that there are at least sixty walled towns varying in population from 6000 to 150,000 people, besides innumerable smaller towns and villages, for the inhabitants (as in Spain) all congregate in villages, the state of police not admitting of the cultivators living scattered over the country. The population is of a very motley character. In its grand divisions it may be said to comprise the following classes.

1st. *Brahmins.* This class is not very numerous in proportion to the rest of the population. They are, however, found congregated in great numbers at certain shrines, or spots of reputed sanctity, just like our own black gentlemen in the cathedral towns. The majority of this class is, I should say, indifferent, or unfriendly, to vaccination. When, however, we find them, as is often the case, in the situation of revenue or judicial officers in our colonial government pay, they generally afford hearty and efficient co-operation.

2nd. *Buneeas,* or traders. These are of two kinds, Hindoos and Seceders, or Shrawaks. Both classes, but particularly the latter, are meek, well-disposed, and duly sensible of the benefits of vaccination.

3rd. *Koonbees,* or cultivators. A very numerous class, sober and hard-working. Generally speaking, they readily bring their children for vaccination; but are timid, and require gentle treatment and persuasion.

4th. *Grassias.* A sort of landholders in their own right, sometimes holding rent-free estates, and at other times paying a small quit-rent. This class consists chiefly of Rajpoots. There are among them a few

Mussulmans. The whole of them are immoderately addicted to opium, savage, lazy, and idle; their habits are too lawless to submit to the control required in the regular army, but they are to be found largely in the pay of Government, as collectors, soldiers, peons, &c. This class is, in general, difficult to be dealt with as to vaccination, being proud, mistrustful, and jealous. Those, however, who are in our own service, are generally easier to deal with.

5th. *Mussulmans*, many of whom are congregated in the cities, but many also of whom are cultivators. The city class support themselves by service, as sepoys, regular and irregular; by the practice of various handicrafts, as dyeing, bow-making, silk-weaving, making confectionary, &c. On the whole, the Mussulmans are fully alive to the benefits of vaccination, but are, in many cases, held back by natural apathy, and by disaffection and jealousy in regard to their women.

6th. *Hindoo Artizans*. This is a very numerous class, comprising carpenters, smiths, tailors, turners, lacquerers, dyers, cloth-stampers, cloth-weavers, bricklayers, potters, &c. &c. These classes are very generally tractable, and give little trouble to the vaccinator; but it is often difficult to get a look at the vaccinated children afterwards, from the intricacy of the lanes and alleys in which these classes often live.

7th. The *Coolies*, robbers from choice, and cultivators from necessity, much given to strong waters and opium, and despising control whenever they have an opportunity. This class is very difficult to be dealt with, and I have always found, that it is only when I am personally present, that I have any success with them. My native vaccinators are generally afraid to trust themselves in a Cooly village, as it is odd but they get a good beating, or, perhaps a cut with a sword. I had, however, a good deal of success with the Coolies in the north of Guzerat, but found it at first very difficult to pursuade them that in registering the names of the vaccinated, I was not intending to carry away, for the use of Government, the most able and stout of the population.

8th. The *Dheras*, or Outcasts. This is rather a numerous class, some being attached to each town and village, and having various and not unimportant duties assigned to them. They are often dissipated, and will eat and drink whatever they can get. It is difficult to get vaccination generally established among them, as the higher Hindoos will often object to allow the vaccine from their children to be applied to a Dhera with the same lancet, and the touching of a Dhera renders a native vaccinator unclean, until he has bathed and changed his clothes.

When this class is vaccinated, it is generally after the vaccination of the other classes has been finished for the day.

Such is a general account of the chief classes in Guzerat. I have said nothing of the *Parsees*, or *Fire-Worshipers*, as they are confined to the districts of Surat and Broach, with a few exceptions. They are so much accustomed to our rule and habits, that they appreciate vaccination completely. The same may be said of the *Borahs*, a sect of Mussulmans largely scattered over Guzerat, as cultivators and traders. Numbers of them are to be found at every market emporium on any of the great roads, and it is their acuteness, general intelligence, and travelling habits, which enable them to appreciate vaccination so well as they do. The permission and countenance of the high priest of the sect is, however, generally necessary.

I shall now give you a sketch of my general mode of carrying on the vaccinating duties. The situation of vaccinator requires me to be continually moving about during the fair-season, i. e., about seven months out of the twelve. Having finished any given district of country, I then write to the civil authority of the adjacent district to say that I am about to vaccinate there, and to request that his native officers may lend their aid to mine in conciliating the people, and in giving notices, collecting the people together, &c. Should the rains be close at hand, I then locate my people in the largest towns of the district, and I myself move into a town. So soon after the cessation of the periodical rains as the country is open, the roads are consolidated, and the activity of autumn malaria has somewhat exhausted, and that is generally the case by the 16th of November, the vaccinating officer leaves his winter quarters and proceeds straight to the places where his native subordinates may have been stationed during the past rains, pitches his tent under a spreading tree, as near to a town or village as may be convenient, and having settled his encampment, sends for the native vaccinator employed in the same place, and directs him to collect as many of the children who have been vaccinated as he can. It is seldom in Guzerat that above a third of the vaccinated can be collected. Many of the mothers hide them, from dread of a European. However, by the first weekly vaccination-day there is generally a good number assembled, and the vaccinator, having examined, severally, their arms, has an opportunity of satisfying himself as to the correctness of the returns given by his native vaccinator. He also has an opportunity of seeing the fresh visicle, and judging of its genuineness. At this visit, also, many of the

respectable inhabitants will bring their children to be vaccinated under the eye of the European vaccinator. This class, however, generally prefer the vaccinator to come to their houses, as the mothers do not like to go out, and are afraid to trust their children away from the house. I have visited many respectable natives in this way, and have always been received with much cordiality. An ancient chair is generally brought out, or procured for the occasion, the best cotton carpet is spread in an upper room, and a regale of sweetmeats is provided. At such visits, too, I generally find sundry persons of the establishment anxious to have medical advice for some ailment, and interesting politico-geographical conversations are entered into by my host and some of the neighbours. I could amuse you a good deal by relating some of the questions asked, but this is foreign to my present subject. On such occasions, however, I enjoy such opportunities of observing the domestic habits of the Hindoos as no other situation can afford.

Returning to my tent, I give notice through the town that I have advice and medicine at the service of the sick, between the hours of 9 and 12 daily, and this part of my duties is, I assure you, no sinecure. I shall, if you like it, give you a few leaves out of my journal on this subject some day or other. There are few chronic diseases which do not come under my observation at these times. I shall now, however, just mention that a great majority of the cases are "wae" or wind, as they include in this class a very numerous string of ailment, such as pains of the stomach, rheumatism, hemierania, and even palsy. Having finished my examination of a town or district, I pass on to another, and keep as much as possible in the centre of a district, where the work is going on, so that I can diverge to the right or the left, and take a rapid view of what each vaccinator is about.

I alluded before to the degree of willingness for vaccination manifested by the different classes of the natives. The example of the more respectable will often bring in the greater number of children in a town for vaccination; and it is astonishing what effect a little hearty co-operation on the part of the native revenue or judicial officers in a village or town will have, while indifference on the part of those persons renders the lower classes timid and reluctant. I recollect, when at the city of Putum some years ago, where my native vaccinator had been employed for some time previous, and with very small success, that soon after my arrival, sundry respectable Mussulmans requested me to come and vaccinate their children. I did so, and next week had the

pleasure to find that applications for fresh vaccination from the arms of those children were very numerous, and that there was afterwards no difficulty found in carrying on the work. At times, when the small-pox rages with virulence, the present danger makes the most ignorant forget their prejudices, and apply for vaccination, and too often is it the case that these put off the application till too late. In illustration of this, I recollect being written to in 1830, by my lamented friend the late Dr. Gordon, superintending surgeon, north-west Division, begging me for God's sake to send him a supply of matter, and, if possible, a vaccinator, by the earliest opportunity. He afterwards stated to me, that he was surprised on going out of his door one morning to find the whole of his yard completely filled with miserable villagers, many of whom had come seventy miles, from the wildest part of our north-west frontier, bringing with them their little ones, some two in a pannier, others two or three on a bullock or pony, &c. They had fled from the small-pox, which was committing dreadful havock in their thinly-peopled country, and came beseeching the Doctor to vaccinate them ; and yet those very people, had I gone among them at a time when the small-pox was not prevalent, would have been most apathetic, if not refractory.

The year 1830 was a severe one. Small-pox then prevailed extensively, and cut off very many children in districts which the vaccinator had not previously been able to visit. I remember that I was at that time written to by my worthy friend, Joseph H. Jackson, Esq., then assistant to the Collector of Ahmedabad, with a pressing request for a supply of vaccine matter. I sent it him forthwith, and he, with indefatigable zeal, vaccinated crowds of people who came to him from the Kattiawar districts. I have known officers, too, in command of out-posts, do much good in this way.

Having been employed for a year in the Konkan division, I may say a little about it, as affording some interesting details. It is a long strip of hill and dale, extending from the foot of the Ghauts to the sea, thickly peopled compared with what one would suppose, and having many of the villages most romantically situated. Dr. Bell first practised as travelling vaccinator here, and it is probably owing to the excellent beginning made by him that the work now goes on so smoothly. The only villages where it does not succeed well are those chiefly inhabited by Brahmins, many of whom hate us and our institutions most heartily. I may add to these a good many of the villages inhabited by fishermen, who are unwilling and suspicious in numerous instances. The suspi-

ciousness probably arises from the circumstances that these fishermen are subject to a capitation tax, and they have an idea that one of our objects may be to get more accurate returns of the inhabitants for its collection. But, generally speaking, in the Konkan, I have had very little trouble. In visiting the different townlands, I had only to send notice on the previous day, and on passing along next morning I found the whole of the inhabitants, with their children, collected at one spot,—each more anxious than another to have their little ones examined. In this way I was often able to examine three or four villages, when travelling along, in one morning, and I have always found the gratitude of the poor villagers most delightful to my feelings. The consequence of the Konkan, too, as regards its population, is not small, for besides the before-mentioned capitation tax, which brings in to Government, annually, two or three rupees for each able-bodied fisherman, it is from the Konkan that the ranks of our native army is chiefly filled, so that here population reckons as money.

Some of your readers may be anxious to know the degree of protection afforded by vaccination in India against small-pox.

The result of my experience is this, that in the southern Konkan I have heard of the modified disease having attacked villages, but I inquired for those villages in vain. I know that in the city of Surat it has appeared, though I think by no means in so large a proportion as in Europe. In this district, I have tried the inhabitants by question and cross-question, but I cannot get them to admit that the modified disease ever attacks the vaccinated, and, certainly, the inhabitants of the rich purgunnahs of Broach and Jumboseer do show, practically, their belief of this, from the unabated confidence they have in vaccination. The experience is, you will say, at variance with experience in England, but I cannot help that. I give you the fact as it is. I have in the north of Guzerat not been able to ascertain the truth so thoroughly, but I have never heard of any complaints, excepting in one instance, communicated to me by Major Speirs, now superintendent of affairs for Rajpootana. He mentioned that the Ranah of Serowi's two children, who had been vaccinated, had both taken the disease (small-pox), as also numbers in the town (no deaths, however, mentioned). I do not know, however, whether the vaccine taken to Serowi may not have altered its nature, and have become purulent, as it often does in the hot season. I rather think that no European vaccinator had an opportunity of ascertaining this fact. Serowi is remotely situated, and is not under the Bombay Presidency.

Such, Mr. Editor, is a sketch of the present state of vaccination in a great part of the Presidency. Did the finances of the country but admit of a larger establishment of native vaccinators, the result would be still more striking than it now is. I think you must see, too, Mr. Editor, that a person in the situation of a travelling vaccinator, where so much is left to individual zeal and activity, ought to be pretty well paid, particularly as the duties of the situation involve a life of loneliness, and of separation from European society, not forgetting the numerous expenses attending travelling; and accordingly when Mr. Elphinstone organised the department, he fixed the salary at 660 rupees per month (including net pay); and from this sum were to be defrayed the expenses of conveyance of children, the purchase of sweetmeats and stationery, and office expenses, travelling, a fit-out, and the carriage of tents, a government medicine chest, and country medicines, alias Bazar drugs. For all these duties and all these expenses, in a sultry and unhealthy clime (for Guzerat is eminently so), I don't think you will say that 594*l.* per annum was too much. "Sed dis aliter visum."

Some four years ago, forth came a fiat, reducing the salary of vaccinators from 660 rupees to 410. Now I should have had not the least objection to bear my share in the distress of the times, but surely a diminution of 150 rupees might have satisfied those patrons (I wish I could say "patterns") of economy, who sit in high places. At all events, it might have been supposed, *a priori*, that having been relieved from the burden of half our salary, we should also be eased of that of *public* expenses, formerly paid out of the salary. Yet would you believe it, Mr. Editor, I was civilly told that the salary having been originally fixed to include every expense, public and private, it must continue to do so until the Court of Directors might choose to modify their order on the subject, for with them the measure was *said* to have originated! Memorial on memorial has been forwarded to that body, but as yet without any result, although three years might have afforded space for at least an *answer*. I think that the Hon. Court is, with all its faults, about the best-working government we have, and I am not without hope that should these lines fall under the eye of some of the twenty-four, they may induce them to examine into the case of a set of men who are working, uncheered by praise, and unrewarded by fame, to forward the happiness of the subjects of our widely-extended Indian empire. They may then say whether it is right that an individual, enjoying a yearly allowance of 370*l.*, should out of that sum provide for

the same public expenses as he did out of a salary of 594*l*. Our case ought to have been considered at the time when that of regimental-surgeons and assistant-surgeons was decided on, and we had every right to participate in the benefit accorded to them.

Our local rulers, taking the order of the Court of Directors in the most narrow sense and construction, kept us down, and do continue to keep us down, to a mere subsistence, and while all of them in private admit the hardship of our case, profess themselves unable to better us, and, as yet, no one vaccinator has received, as a reward for his activity, an appointment of a better description.

I remain, Sir,
Your most obedient servant,
A Bombay Assistant-Surgeon.

BENGAL VACCINE ESTABLISHMENTS.

The history of Vaccination in Bengal presents a painful picture of the evil consequences resulting from the want of some settled principle in the organization, and of a consistent perseverance in the execution of any general scheme designed for the specific object contemplated. It exhibits at one time a hurtful struggle between efficiency and economy, at another a vain attempt at compromise between the prejudices of ignorance or superstition, and the views of an enlightened benevolence. The promotion of vaccination has never ceased to engage the consideration of successive Governors General, of each new Medical Board, and of all the Superintending Surgeons in Bengal; a liberal ear too has ever been lent by the Hon'ble the Court of Directors to recommendations emanating from the Supreme Government for the adoption of various measures calculated, as it was thought, to further the use of the

remedy among the people ; but yet until the present hour, it has made no corresponding progress in public opinion, and its practical benefits are still almost entirely confined to the European sojourners in India, and to their families and followers.

From Mr. Cameron's Report, and the Records of the Medical Board, we learn that in 1828 there were 30 Vaccine Stations maintained at the expense of Governnment in the Bengal Presidency, viz. one at Calcutta, Agra, Chittagong, Cuttack, Dacca, Monghyr, Moorshedabad, Nagpore, Allahabad, Benares, Bariel-ly, Bhaugulpore, Cawnpore, Delhi, Furruckabad, Hydrabad, Patna, Oudipore, Rajpootana, Rungpore and Sumbulpore, at an average expense each of Rs. 260 per mensem, and at Ajmere, Jeypore, Balasore, Lucknow, Merutt, Kotah, Soobathoo, Arracan, Jub-bulpore, at 60 Rupees per mensem, making an annual expenditure of Rupees 72,000.

In a letter from the Medical Board to Government, dated 22d December, 1828, the "impossibility of "maintaining a pure and genuine lymph in the "Upper Provinces during certain months," is distinctly stated, and that "Calcutta is the only place where it can be constantly kept up throughout the year." It is also frankly admitted that "a *spurious* "*disease* is propagated in the Provinces by the "Native Vaccinators at certain periods of the year." The Board recommended that the expensive establishments then maintained at 16 Stations should be reduced to 120 Rupees each, and that 18 new vaccine stations should be formed at an expense of 60 Rupees each, while Calcutta, Dacca and Patna alone should be continued on the existing scale of

allowances, "which places should be considered "the General Depots, from whence the other sta- "tions might at all seasons be supplied with genuine "virus."

The two recommendations of greatest importance then submitted by the Board, were 1st, that 25 *Military* Vaccinating Stations be established on similar allowances with the small Civil ones, and 2ndly, that the "operation of vaccinating and the subsequent manage- "ment of all cases should be entirely undertaken by "the *European* Medical Officer, and nothing left to "his Native Assistant." Though the Medical Board do not in this letter to Government dwell sufficiently upon the advantages of these proposals, they have always appeared to me to involve two most important *principles*, which it is much to be regretted should have been overlooked, viz. 1st, the facility which *Military* Surgeons have, both of recommending and practising vaccination among the Native Soldiery, and as a natural consequence among the numerous followers of the Camp, (a facility which is afforded by the peculiar nature of the intercourse subsisting between the Bengal Soldier and his Officers, unlike that which subsists between the Natives of Bengal and any other class of Government functionaries whatever;) and 2dly, the inexpediency of trusting so delicate an operation at all, to the hands of ignorant Native Vaccinators. Had these sound principles been then recognised and acted upon, who can doubt that in the course of the 16 years which have since elapsed, the benefits of vaccination would have been triumphantly demonstrated by the protection at least of our Sepoys and their families, while the evidence

thus afforded in its favor would have had its reasonable effect upon the people at large.

The Government of India was, however, at that time too intent upon schemes of retrenchment to weigh with due consideration any recommendation not founded upon that basis. The following Minute by Lord W. Bentinck displays indeed a clear apprehension of the duties of a Christian Government in connection with such a subject, and of the requirements of the State, but it is not possible to read it to the conclusion without a feeling of painful surprise that these enlightened views should (though but for a time) have given way to other considerations, affecting the interests, and paralysing the zeal of the very Agents on whose ability all efforts of the kind alone depended; while the claims of the great mass of the people are indefinitely deferred.

Minute by the Right Hon'ble the Governor General, 14th February, 1829.

"It is obvious from the admissions made by the Medical Board in their Secretary's letter of the 16th December last, as well as from other sources of information, that the Vaccine Institutions have not answered the ends contemplated; and that their success has not in any degree corresponded with the expense attending them. The existing system must therefore be deemed erroneous, and the heavy annual charge of upwards of Rupees 69,000 incurred for the establishments a fit object of retrenchment.

"The Medical Board in their proposed modifications of the system do not profess to aim at a reduction of expense. They point out a scheme for the consider-

ation of Government which they think better adapted than the one in operation for preserving and disseminating the vaccine matter, and for introducing among the natives the practice of vaccination with success. I do not however concur with the Medical Board in the sentiments they entertain on the subject. Their proposed alterations rid the system of not one of the errors which obstruct its efficiency. On the first introduction of vaccination into India the hostility of the climate to the uninterrupted preservation of the virus, and the reluctance of the natives to submit to the process might have been looked for. But experience has shewn that the natives are indifferent, if not averse to the practice, and that in most of the provinces beyond Patna, owing to an extremely heated and arid atmosphere, it is impossible for some months of the year to maintain the practice, or to preserve the genuine vaccine matter—yet the Board recommend the addition of several new Stations within the range of the unfavorable climates, and where no facilities offer for inducing the natives to submit to the process. This they propose to accomplish by giving to each Medical Officer at the new and old Stations a small salary to secure their co-operation and a couple of active peons for the purpose of procuring subjects for inoculation.

" On the supposition that this plan possesses little or no advantage over the existing System, and observing that it is equally expensive, I would refer to the original intention of Government in creating vaccine institutions. That intention appeared to have been to maintain a constant supply of vaccine matter which might be always available for the protection of

the families of its servants against the contagion of Small-Pox, and to introduce amongst its native subjects the benefits of vaccination. To effect these objects, Establishments have been formed in various parts of the country. Their success however as is evident from the returns, and the reasons assigned for their partial failure, has in no degree corresponded with the expense attending them, and consequently the expectations and wishes of Government have not been fulfilled.

" It is absolutely necessary however for the important purpose first noticed, that the great blessing of vaccine inoculation should be preserved in India. This object may I think be maintained at a comparatively moderate charge, and accompanied by advantages in some degree commensurate with the expense, by establishing a few depots of vaccine matter to be carefully and diligently supported. Following up this view of the subject, it only remains to determine their nnmber and locality. In selecting places for the depots choice ought to fall upon such spots as present the fewest obstacles to success, that is where the climate is least unfavourable, where the European population is considerable, where from a long and close intercourse with Europeans, the natives may be supposed more assimilated to them in their customs and notions, and where consequently the least difficulty will be experienced in procuring subjects for inoculation. Calcutta, Dacca, Moorshedabad and Patna appear to me, and the Returns of persons inoculated countenance the supposition, places very suitable for vaccine depots. I would propose therefore that vaccine establishments on their present

footing be continued at those places, and that all other institutions at principal and subordinate stations be abolished from the 1st proximo, unless it be thought highly desirable to uphold notwithstanding the disadvantages of climate, one or two principal stations in the Upper Provinces. In this case, I would not object to continuing to Agra and Barielly, or to any two places that might be selected, vaccine arrangements on a modified scale of Rupees 160 per mensem each. I mention Agra and Barielly for their geographical positions as convenient for disseminating the virus at proper seasons; and also with reference to the climate of Barielly, and the number of Europeans about Agra.

"The number of vaccine stations can be hereafter gradually increased under a proper and well ordered system, in proportion as the benefits of vaccination became better known and appreciated by the native population: and when medical experience and skill have devised sufficient means for keeping and disseminating the virus in climates now found so inimical to its uninterrupted preservation.

"The financial results of this proposal will be,—if four stations only are maintained, an annual expenditure of Rupees 13,680;— if six, of 17,520 instead of 69,144.

(Signed) W. C. BENTINCK.

February 14*th*, 1829."

Accordingly the following Resolution was passed in Council on the 2d March 1830, and transmitted to the Medical Board the same day:

Extract from the Proceedings of the Right Hon'ble the Governor General in Council, in the General Department, under date 2d March 1830.

Resolution.—"In conformity with the Propositions submitted by the Governor General, in His Lordship's Minute, dated 14th February 1829, Resolved, that the existing allowances for superintending vaccination enjoyed by the Surgeons and Assistant Surgeons employed at Civil Stations in the interior be discontinued from 1st April next, excepting at the following principal Stations where the Medical Board will take measures to establish depots for the preservation and distribution of the vaccine matter, viz. 1, Dacca, 2, Moorshedabad, 3, Patna, 4, Benares, 5, Barielly, and 6, Soobathoo.

" Resolved, That the Surgeons and Assistant Surgeons in charge of these depots, shall receive respectively a reduced allowance on this account, to cover all charges of whatever description, connected with the preservation and distribution of the vaccine matter and the maintenance of the depots, of 160 Rupees per mensem, in addition to the other emoluments attaching to their situation. That the establishment and allowances attached to the General Superintendent of Vaccination at the Presidency remain on the same footing as heretofore, and that it be the duty of this Officer to correspond with the Medical Officers in charge of the depots, in order to supply them with virus when necessary and otherwise promote the objects of the Institution."

The immediate practical effect of these measures became apparent soon after they came into operation, and are truly distressing, when the possible (nay

probable) loss of life which they may have occasioned is contemplated. It will be seen in Table H. page 177, that the persons protected by vaccination throughout the whole of Bengal and Agra Presidencies

In 1830	amounted to	61,910.
In 1831	.....	21,394!
In 1832	.....	15,119!!

Referring to the preceding page 176 it will be seen, that at some places where many *thousands* had been vaccinated in 1830, the operation came to a sudden and total stop in 1831, and has never been resumed.

The Medical Board failed not urgently to represent this state of things, coupling their observations with respectful remonstrances regarding the injury done to Medical Officers thus harshly mulcted of their heretofore established allowances, as well as the privation to which the Natives were in many places now subjected, of all protection whatever against Small Pox. Suggestions were also submitted for other new measures calculated, as it was thought, to promote the diffusion of the preventive. His Lordship's sentiments on these propositions were made known to the Medical Board in the following Minute, copy of which was transmitted to them on the 4th July 1832:

Minute by the Right Hon'ble the Governor General, dated Simlah, 27th June, 1832.

"Suggestions for a more general diffusion of vaccination would come more appropriately from the Medical Board, when the subject is cleared from the doubts in which it would appear from their Secretary's Circular to be, in an essential particular

involved. This particular, viz. the quality of the virus in use, is the first point to be determined, for nothing but mischief and painful disappointment can arise from the spread of a Spurious Disease.

"The Medical Board may therefore be instructed to furnish Government with an abstract of the letters received in reply to their Secretary's Circular, and to report in their opinion how the virus is to be revived and maintained, should the result of the correspondence show that its efficiency is impaired or destroyed.

"This point set at rest, the Board should, in order to inform Government of the annual expense which will attend their scheme, state the number and distribution of the Medical Officers to whom they would assign the addition of Rupees 50 per mensem, and according to the surest Returns in their office, the sum per annum, to which the proposed "*Capitation money*" would probably amount, and how many subordinates on a salary of Rupees 7 per mensem would be required.

"I had rather have seen the Board's plan for diffusing vaccination, disconnected from subsidiary arrangements for improving the allowances of Medical Officers at Civil Stations, as this in some measure appears to be. That vaccination is a real blessing to each individual to whom it proves efficacious no one denies, and in such view it claims the attention of Government; but beyond this limited sphere, I conceive our concern about the matter is nearly useless. To whatever degree we may stimulate the efforts of European Medical Officers, their influence on the vast population is but a shower on the sea, nor will the

progress of the Preventive sensibly arrest the ravages of the variolous disease until the habits, prejudices, and feelings of the people are so far changed, that some from amongst them may come to understand the advantages of rational medical treatment, and to prefer simple remedies to the expense, fatigue and inconvenience of travelling in masses of men, women, and children, many days journey, to appease at some noted shrine the presiding deity of this pestilence.

"In and about Calcutta, still the Head Quarters of virulent Small Pox, where the endeavours to extend the preventive, must have been most strenuous, I apprehend that the number vaccinated since its first introduction is very disproportionate to the population; probably the Medical Board have the means of furnishing some information on this head."

(Signed) W. C. BENTINCK."

Towards the end of 1832, the Governor General became however so far satisfied of the necessity of a more liberal policy in respect of vaccination, and of the expediency with this view, of restoring a portion of the small salaries of Civil Assistant Surgeons, that he forwarded with his recommendation to the Court of Directors, a new scheme, originating with the Medical Board, coupled with an application for an annual grant of Rupees 40,000 "for the purpose "of remunerating the Medical Officers, European "and Native, employed in conducting vaccination at "certain Civil Stations." Of this sum it was proposed that Rupees 50 per mensem should be given to 56 Civil Assistant Surgeons as Superintendents, *(dependent on 50 persons being vaccinated per*

mensem,) and the remainder in small fixed salaries to the Native Vaccinators, besides an allowance of Rupees 12-8-0 for every 100 persons they vaccinated. As for Military Surgeons His Lordship observed, "that the duty of vaccination as far as concerned "the Corps and the Camp-followers to which each "Surgeon or Assistant Surgeon was attached, ought "to devolve on the Company's Military Medical "Officers, as in H. M. Service."

The sanction of the Court of Directors was conveyed to these recommendations in April 1834; and subsequently in their public letter, dated 14th June 1834, from which the following is extracted:

"Para. 3d. By our letter No. 22, of 9th April 1834, you were informed that we acceded to the recommendation of the Governor General, that Assistant Surgeons at Civil Stations, not drawing more than 300 Rupees a month, should be granted a conveyance allowance of Rupees 30 a month, and we now sanction the further grant of Rupees 20 a month, (as recommended by the Governor General in his Minute of 31st October 1832,) to such Surgeons of Civil Stations as may be appointed Superintendents of Vaccination.

4th. We also now sanction the several other suggestions, forming part of the Governor General's Minute of 27th June and 31st October 1832, limiting as he has proposed to do, the total expense on account of vaccination to Rupees 40,000 per annum."

The following Rule founded on the above grant was published in the *Government Gazette* in December 1834, and continues, I believe, in operation at all the Presidencies of India:

"From and after the 1st January 1835 ensuing, there shall be allowed to all Assistant Surgeons at Civil Stations, whose total allowances do not exceed Rupees 300 per month, the additional sum of Rupees 50, viz. Rupees 30 for conveyance allowance, as already sanctioned for the Presidency of Fort William, in General Orders, in the Military Department, dated 18th September 1834, and Rupees 20 as compensation for undertaking the duty of superintending and diffusing the practice of Vaccination. The Governor General in Council expects that all Medical Officers drawing higher allowances than above indicated will gratuitously undertake the duty."

The Provincial depots, viz. those of Dacca, Moorshedabad, Patna, Benares and Barielly were, however, permitted to remain on the existing footing, by what was afterwards declared to be an "oversight."

The utter failure of this new scheme for promoting the extension of Vaccination became soon evident; and surely this is not to be wondered at, seeing that the condition coupled with the grant of Rupees 20 per mensem to the Civil Surgeons, viz. that of *successfully* vaccinating 50 *persons every month in the year*, involved either the performance of an impossibility, or the certainty of a fictitious Return. The required number was almost immediately reduced from 50 to 30. But there still remained and remains the insuperable objection of climate and season, applicable to "all the stations above Patna," whereby, in obedience to this order, a spurious or counterfeit disease is of necessity introduced, and possibly forced upon the people, under the authority too, and bearing the stamp of Government.

The "Capitation Allowance, or Head Money," as it was called, was found to be a mere premium on mendacity, the Native Vaccinators never failing to make up the number requisite to entitle them to the fee, but being always unable to produce any of the subjects said to be vaccinated, for inspection in evidence of their veracity. After a persevering trial of the system for two years, its short comings again engaged the attention of the Government; inquiries were addressed to the Medical Board, and explanations sought of the striking disasters every where reported as having *followed* vaccination, while its benefits were no where apparent.

Replying to these inquiries on the 7th March 1837, the Medical Board say, "We most fully concur with your Lordship in deeming improvement in the system of vaccination necessary. The first and prerequisite step to its diffusion in this country has, we regret, yet to be taken. We have not succeeded in making its value acknowledged, or even known by the people. At present our efforts are frittered away, and in a great measure lost among straggling villages, where from the difficulty of finding persons who will submit to the operation, the virus cannot be kept up efficiently for many consecutive weeks in the year."

Even in Calcutta where the practice of vaccination had at one time been very popular and successful, the remedy had lately fallen into disrepute among the native community, owing, it was alleged by my predecessor Dr. A. R. Jackson, to the carelessness of some of his Vaccinators, but chiefly to the difficulty he found in supervising their extensive operations, and ascertaining their success or failure, by per-

sonal inspection of subjects, on the eighth day after vaccination. To obviate in some degree this difficulty, Dr. Jackson suggested to me, upon taking charge of his office on 1st January 1837, a little arrangement, the success of which I believe neither of us at the time anticipated, nor for some time afterwards did the real cause of this occur to me.

It was thought that by having a Vaccine Depot in a more central part of the populous Native town, some greater facility would be given to the poor, and some difficulty removed from their way, while requiring of them to bring their children for inspection on the 6th or 8th day, to a place so much nearer their homes than my private residence in Chowringhee. The Government Dispensary at *Gurrunhattah* (in Tannah 30) occurred to us as conveniently situated in this respect, and I forthwith commenced operations there, and made a point of superintending them personally at a stated hour every morning.

It chanced that, in that year, Calcutta was visited by the Small Pox, in an Epidemic form, and the alarm thereby caused, tended no doubt to excite the attention of the people to the remedy against it, proffered them gratuitously at the Dispensary, and procurable at the hands of the English Doctors who there also daily distributed medicine to the sick. Vaccination thus publicly practised at the Dispensary became necessarily "known," to at least 200 sick persons daily; and as its objects and benefits could not fail to be discussed at a moment when the Small Pox was prevailing among the people, it needed no great persuasion to satisfy the crowd, that those who were so benevolently assiduous and so successful in the *cure*

of disease, were equally sincere in their recommendation of a measure as effectual for its *prevention*.

The obvious association of these two philanthropic applications of Medical Science, and the natural effect of this simple argument on the Native mind now so impressed me, that I lost no time in establishing another Depot or vaccine station at the Park Street Dispensary, whereof I myself had charge at the south extremity of Calcutta (in Tannah 23). My own house No. 1, Chowringhee Road (in Tannah 19), remained as a Central Depot.

The number of Native Vaccinators under my orders hitherto had been 12;—I obtained leave from the Medical Board to discharge three of them, (the worst and most lazy,) entertaining two writers and two peons in their stead, and stationed three of the nine remaining at each depot.—I required each one of them to attend in his turn twice a week, statedly, at the Dispensary, bringing with him for inspection and registry the children he had vaccinated in the neighbourhood during the interval. From these, all personal applicants at the Dispensary were vaccinated at once on the spot, frequently by myself and the European Apothecary, but always under his or my own eye, and a careful registry was made of every subject vaccinated at the Dispensary; the parents were easily induced also to return with them for inspection on the same day next week.

In short, a few months served to convince me that in order to make vaccination "known" and its "benefits acknowledged" by the ignorant, improvident and prejudiced Bengallees, all that was necessary was to let them witness its operations anxiously and

regularly conducted by European medical men, with the same care as are all the other branches of their professional duties, whereof it should be considered an essential and important part.

At the close of the year the Medical Board did me the honor to report to Government in terms of great satisfaction, that the "number of persons vaccinated in Calcutta during the preceding nine months, was more than treble the annual number vaccinated in any of the three preceding years."

The gratifying success of the new experiment in Calcutta led me to hope that similar arrangements in the large Native towns in the Provinces might be followed by similar results, and it appeared to me that Lord Wm. Bentinck's proposal to limit our efforts for the maintenance and promotion of vaccination to the large towns, wanted but this vivifying principle, viz. the combination of gratis Vaccination, with the gratis distribution of medicine to the sick, by European Surgeons, to make the Prophylactic as popular as English medicine among the Natives of Bengal. I therefore urged upon the Medical Board that instead of prolonging the vain effort to force vaccination upon the people, the grant of Rupees 40,000 now again placed at their disposal might be most advantageously employed in aid of Vaccination, if applied to the maintenance of public Dispensaries or Native Hospitals in several of the large towns, and that at these during the winter and spring months *alone* should vaccination be practised; moreover that an English Surgeon or Assistant Surgeon should be nominated substantively to the charge of each, with one or more Sub-Assistant Surgeons

from the new Medical College, as soon as any of them were pronounced qualified.

The Medical Board, however, were not prepared to second my views, and indeed do not appear to have understood my reasoning. They now suggested a totally new and extraordinary experiment.

From the Medical Board to the Hon'ble the Governor of Bengal.

My Lord,—We have the honor to forward a communication addressed to us by Dr. Duncan Stewart, the purport of which is to recommend a remodelling of the Vaccine Department, and a new distribution of the grant of Rupees 40,000 annually, which is now at our disposal. Having very recently addressed your Lordship in Council on the same subject, we need not repeat opinions which remain unaltered.

Dr. Stewart's suggestion for concentrating our efforts to diffuse the preventive in certain considerable towns between Calcutta and Delhi inclusive, in order to keep all parts of the country regularly supplied with fresh virus,* has our approbation; and indeed it differs little from the plan already submitted by us to Government. But the proposal which he founds on it to employ six Assistant Surgeons entirely† in vaccinating, cannot be entertained consistently

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* This was not *my* argument. "Fresh virus" could always be sent from Calcutta with perfect certainty of success, to the most distant Stations in a few days *at the proper season*, and may now, (thanks to Steam Communication,) be had from London direct in six weeks time, in any part of India.

† This is a strange misrepresentation: These Officers were not to be *entirely* employed in vaccinating, but in the Medical management of a

with the interests and general utility of the Medical Service.

The present salaries unfortunately being insufficient to induce Civil Surgeons to devote their minds to the profession, or even to prevent them from partly renouncing it by becoming Merchants, we consider the allowance for vaccination most beneficially bestowed when it can be made to increase the income of such of them as have leisure and inclination to perform the duty for which it is granted.

Relief to the sick poor, of whom many thousands are suffering and dying under curable diseases throughout the British Provinces, having hitherto been left for most part to Medical Officers who may find benevolence its own reward, it will afford us real satisfaction if Government consent to provide accommodations, establishments, and medicine for Dispensaries in all or any of the principal towns. This subject has often been represented, and we trust it may attract your Lordship's serious attention.

Dr. Stewart is mistaken we apprehend in attributing to Natives generally a partiality to our remedies and practice. The rich and higher classes, unless when enlightened by European education and habits, invariably prefer the prescriptions of their own Hukeems and Byds to those of our Physicians. The indigent, at least equally prejudiced and ignorant, would manifest the same predilections if they had the means of indulging them, in other words if they could

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Native Hospital, in collecting and arranging the vital and Medical Statistics of the Town and District, &c. &c., and *only* in the cold weather in vaccinating.—D. S.

pay their own practitioners ; but when under the pressure of pain, it is from necessity and not choice that they overcome their antipathies and accept offers of gratuitous treatment and attendance from Europeans.

Adverting to the dislike which the people of this country show to the necessary discipline of our Hospitals, we consider Dispensaries best suited to their wants, and conceive that the superintendence of such institutions might be very properly associated with that of vaccination. The aversion, or at least indifference of the Natives to the prophylactic, is of similar origin and character with their disesteem of European medicine. Hindoos and Mussulmen still employ Inoculators who *produce*, instead of Vaccinators, who *prevent* Small Pox.

Were it allowable to expend any part of the funds intrusted to us in an Experiment, we should be disposed to hold out some substantial inducement to those bodies of men engaged in Inoculation, in hopes of prevailing on them to substitute vaccine for variolous matter, in going their periodical circuits. If *they* consented to become servants of Government on that condition, their confiding countrymen might know nothing of the innovation except from its beneficial consequences.*

(Sd.) T. SMITH, *Senior Member.*

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* Note.—It should have been added,——but

"Drink the ensnaring draught, and so deluded—live."—D. S.

The Government Charitable Dispensaries.—The idea of establishing public Hospitals or Dispensaries in the centre of the large and populous Towns of India under the professional management of Native Surgeons and Physicians educated in the rising Medical College of Calcutta, had for some time engaged the benevolent consideration of the Earl of Auckland, who contemplated by means of this agency, not alone the immediate and efficient relief of the Native poor from the many and dangerous diseases by which the country is so often ravaged, but also the gradual silent yet certain diffusion among the people at large, of a correct knowledge and due appreciation of the manifold benefits of Medical Science in its extended application to the preservation of public health, the protection from disease, the cure of sickness, the prolongation of life, and the increase of a vigorous and robust population.

Following out the expansive and enlightened views of Lord William Bentinck regarding the Medical Education and subsequent employment of Native Bengal Youths, the Governor General began to entertain a well grounded conviction that the time had arrived when he might confide (with due assistance and support from the British Civil and Medical Officers of Stations) the management of a few such Dispensaries *substantively* and *responsibly* into the hands of some of the most distinguished young men who had then taken their degrees at the Medical College in Calcutta, after a very searching examination into their acquirements, and general fitness. There were not wanting many persons however, and these well acquainted with the Native character, who

sincerely doubted the possibility of ever converting Hindoo youths, however well educated, into skilful Surgeons, or independent prudent and resolute Medical practitioners; but the "experiment" was at least a more legitimate one than that last recommended by the Medical Board; and the decided success which has attended it, in every Town where a Dispensary has been established, must be highly gratifying to the amiable Nobleman who founded them, and to all who take an interest in the advancement of the people of India.

It is not my design to detail the history of these Institutions farther than in its connection with vaccination. That *this* formed a part of the Governor General's scheme in their establishment, will appear from the following letter written in reply to certain inquiries addressed to me on the subject, in May 1837.

From Dr. D. Stewart,

Superintendent General of Vaccination,

To R. D. Mangles, Esq.,

Secretary to Government.

Dated 13th May, 1837.

Sir,—I am honored by receipt of your letter of the 11th instant, requiring my opinion, first, upon the "compatibility of the duties of Native Vaccinator with those of Native Hospital Doctor;" secondly, upon the probable advantage of "intrusting the duties of both offices to one individual, and whether such an arrangement is likely to impede the objects for which a Vaccine Establishment is maintained by Government."

Upon the first question I would beg to remark that Vaccination is as strictly a professional operation as that of bleeding or cupping, and I have no hesitation in stating the opinion forcibly impressed upon me, that its practice ought never to have been assigned to any other persons *in India*, than Surgeons and their Assistants, or viewed otherwise than as a part of their ordinary duties.

The science of Medicine provides for the prevention as well as the cure of disease, its professors are expected to teach a knowledge of the causes of disease as well as of its treatment, its practitioners fulfil but half their duty when they limit themselves to one branch.

The Government when it disunites the practice of vaccination from that of other professional duties, defeats its own benevolent purposes, and at the same time incurs a double expense. Some degree of discredit too is apparently cast by this separation, upon the former Department, for though equally important to public health it is the worst paid. The trifling remuneration allowed to the Native Vaccinators while it is insufficient to procure the services of the better educated and respectable Native Doctors, almost of necessity throws these Vaccine appointments into the hands of the lazy and the ignorant, alike incapable of combating error and prejudice, and of communicating a knowledge which they do not themselves possess. Thus a premium is in fact indirectly held out to mendicant empirics and religious impostors who avail themselves of the ignorance, the prejudices and the fears of the vulgar to recommend the old and dangerous practice of Variolous Inoculation.

In a communication lately made by me to the Medical Board, I endeavoured to show how necessary it appears to be, with the view of promoting Vaccination in Bengal, to invest it at once with a Professional character, by uniting its practice with that of the administration of medicine to the sick poor, who being already sufficiently partial to English medicine, are generally every where eager to obtain it, when suffering from pain or sickness.

For these reasons I could wish to see the present Vaccine Establishment abolished, at least *in name*, except perhaps in Calcutta, since that is declared "to be the only place on this side of India where vaccination can be maintained throughout the year," and where lymph can be most readily, surely and expeditiously obtained at all times.

In its room I could wish to see a more Professional, and more generally useful Department organized, which should indeed include vaccination, but along with this, and other measures for the prevention of disease, should also provide for the cure of those who become its victims.

With respect to the second question my opinion is submitted with the utmost diffidence. I perceive that it refers only to the case "in which a Hospital or "Dispensary may either already exist, or be in future "established." This I presume does not include such places as Regimental, or Jail Hospitals. At these, it would probably be found unsafe to sanction the absence of the Native Doctor from his post, upon any plea whatever; and again, as these Hospitals are either within Cantonments, or if at Jails, are remote from the populous part of the town, and beset with gangs

of idle Police Peons, &c., I fear it would not be easy to establish, in immediate connection with them, a Dispensary to which the poor and timid Hindoos would readily gain access.

If however the Dispensary or Native Hospital be in the centre of the Native Town and of its dense population, if the English Medical Officer Superintending be zealous, methodical, humane, and punctual in his attendance, giving thus assurance to the surrounding poor of their interests being personally cared for by the English Doctor, if he be allowed the assistance of two or more intelligent Native Doctors from the ranks of the College Graduates, well and liberally paid, as their merits and acquirements would entitle them to be in any part of the world, there can scarcely be a doubt that thousands will voluntarily resort thither to be *vaccinated* as well as *physicked*. The past history of Vaccination in India bears out this opinion. The art was first practised under the benevolent Shoolbred in Calcutta, at the Native Hospital.

Taking this view of the case I beg to offer one suggestion which is, that the Dispensary and its duties ought to be the *primary charge* of the English Medical Officer named. Indeed if he is occupied in Statistical Researches he will have enough to do, without having to visit a distant Jail Hospital, or the scattered families of Government Servants besides.

(Signed) D. STEWART.

Early in 1838, the Government Plan had been so far matured and commenced upon in several towns, that its extension became practicable. The following paragraphs from a public letter addressed to the Civil

Commissioner of the Rohilcund Division, give a concise view of the System which had been now organized, and which subsequently obtained the full sanction of the Hon'ble the Court of Directors and a special grant of Rs. 30,000.

From J. Thomason, Esq.,

Offg. Secy. to Govr. Genl., N. W. P.,

To J. Davidson, Esq.,

Offg. Commissr. Rohilcund Division.

Dated 27th April, 1838.

Sir,—With reference to my letter to your address dated the 28th February last, regarding the Dispensary at Bareilly, and the other correspondence which has taken place regarding the similar Institution at Moorshedabad, I am now directed to inform you that the Government of India have sanctioned the immediate institution of Dispensaries in some of the large Towns in the Bengal Presidency, and that the Right Hon'ble the Governor General has determined on modelling the Institutions at Bareilly and Moorshedabad on the same principles.

2d. The general outline of the scheme adopted by the Government is the following:

3d. The Dispensary will be under the charge of the Civil Assistant Surgeon, to whom an allowance of Rupees 50 per mensem, including the 20 now allowed for vaccination, i. e. a net addition of Rupees 30 per mensem, shall be granted for its management. An educated young man from the College at Calcutta, with a salary from 40 to 100 Rupees, will be

placed, as soon as he can be supplied, on the Establishment. A small number of beds sufficient for cases of accident, extremely acute cases, and cases requiring important Surgical operations, will be attached to the Dispensary, but it is not intended that these Establishments shall, as is the object of Hospitals, be open to the entertainment of the casual sick. Two or three subordinate assistants capable of performing the Vaccine operation will also be attached to the Institution; but His Lordship has been desirous that in lieu of ordinary attendants, boys, who have received a good elementary education, should be occasionally introduced as apprentices on small allowances, to whom instruction may be given in the subordinate branches of Medical practice by the Officers in charge, and who may ultimately become qualified at least for the lower grades of our Medical Service, Civil or Military. It is estimated that the total charge of each Institution may be limited to from 250 to 300 Rupees per mensem. The Dispensary will be provided with Medicine and Surgical Instruments from the Government Stores, upon indent to be forwarded and approved by the Medical Board, and is to be open as a place of practical instruction to any youths of the place who may desire to attend. To the Native Assistants the advantage of private practice will be held out.

4th. The Medical Board are more fully acquainted with the views of Government in this respect, and upon them will devolve the duty of arranging the details of the plan, and adapting the scale of expenditure to the local funds which are applicable to the

purpose; the Government being of course prepared, if the local funds should be deficient, to make up in these two instances the monthly allowance to that which has been above stated.

5th. His Lordship is further pleased to constitute the Judge, the Magistrate, and Collector, and the Civil Surgeon for the time being, at each station, a Standing Committee for managing the affairs of the Institution, and corresponding with the Medical Board on the subject. You will also, as Commissioner, take a part in the deliberations, and have a voice in them whenever you are present at either station, or otherwise see reasons to exercise any interference in the proceedings. The Civil Surgeon will be also ex-officio Secretary, and conduct the correspondence of the Committee. If the Members are desirous to secure the co-operation of any respectable Native gentlemen resident at either station, you are requested to mention their names, and His Lordship will be happy to add them to the Committee.

6th. All the correspondence regarding the Institution will be ordinarily conducted through the Medical Board; but if at any time you think such a course unnecessary, you are at liberty to address the Government direct on any matter connected with the Institution.

7th. You are requested to communicate this arrangement to the gentlemen who are concerned, and to place them in communication with the Medical Board, by whom they will be furnished with further instructions. The Board will also fix the date on which the establishment and allowances noted above will begin to take effect.

8th. Copies of this letter will be sent to the Medical Board, the Civil Auditor and the Accountant General.

(Signed) J. THOMASON,

Offg. Secy. to Govr. Genl., N. W. P.

In the course of the following year, Dispensaries were established upon the above plan in twelve large Towns, at an average cost of Rupees 250 per mensem each,—and to these have since been added two more. The present localities are Bhowanipore (a Suburb of Calcutta), Pooree, Moorshedabad, Dacca, Chittagong, Patna, Benares, Allahabad, Cawnpore, Agrah, Delhie, Bareilly, Mooradabad, Jubbulpore, Futtehghur, and Muttra.

In 1843, a very interesting volume was published by order of Government, containing the three First "Half-yearly Reports of the Government Charitable Dispensaries," viz., from 1st August 1840 to 31st January 1842, and a Second Series of these Reports has just issued from the Government Press, giving a Summary, and Extracts from the Half-yearly Reports from the latter date to 31st July 1843, by the Medical Board.

Both volumes contain, along with a few crudities of style and expression, and some immature opinions and observations, ample evidence of great ability, zeal, energy, and professional spirit on the part of all the Native Sub-Assistant Surgeons, many of whom have highly distinguished themselves as practical Surgeons, and all appear to be much respected as Physicians. The second volume exhibits considerable improvement in all respects on its

predecessor,—greater uniformity in the tabular details of diseases—more sound general observations,—more correct remarks regarding the influence of external causes on the character and course of disease,—and greater aptitude in the discrimination of leading features, from the accidental and trivial symptoms of particular diseases: Indeed the clinical remarks, if illustrated and borne out by accurate statistical returns (which unfortunately are entirely wanting, or of the most meagre sort) promise to make any future volumes most valuable contributions to Medical Science.

I have been greatly disappointed however to find little or no mention of Vaccination in either volume, even at places where Small Pox has been prevailing epidemically to a frightful extent, as at Bareilly last year.

From Cawnpore, Dr. Jas. McRae (vol. 1, p. 133) reported on the 1st February 1841, that "the Vaccinator was only entertained on the 2nd of last month. He vaccinated 47 during the month, six successfully, and the remainder are cases whose results are not yet known, as they were vaccinated towards the end of the month, and a few unsuccessful ones; at present it would be premature to form an opinion as to his influence in propagating the Vaccine amongst the natives of the City. The natives have no great objections to vaccination, but their apathy and dislike to European interference throw great obstacles in the way of any measures that may be taken to render vaccination general. The Vaccinator visits the City daily, in company with the Naik of the Hospital Guard, no Chuprassy being allowed. I hope by next Half-yearly Report to be able to give a favour-

able opinion as to his success in diffusing the prophylactic disease amongst the native population of this District."

The following interesting notice of Small Pox and Vaccination at Jubbulpore is taken from the Report of the Sub-Assistant Surgeon Shamchurn Dutt, in charge of the Dispensary, and is dated 1st September 1842 : (Vol. II. p. 111).

"*(Small Pox.)*—The next disease, Small Pox, raged simultaneously with the former (Remittent Fever.) It was in a large number of instances extremely severe in its character, and occasioned some mortality throughout the whole district. The difficulty with which a case of small pox may be brought to the Dispensary, and the general prevalence of superstition debarred many to participate in time the advantages which this institution affords, the benefits of which they are so fully aware, looking upon it with grateful feelings as one of the numerous blessings from an enlightened Government. I need not state that it is an universal belief throughout the whole country that Small Pox and Measles are of supernatural origin, and that all medical interferences during its course are highly iniquitous, as they bring down the wrath of the Goddess from whose hands the scourge descends. Hence it was that a very small number of applications were received during the course of the disease ; but subsequently, many were brought labouring from its effects—diarrhœa with low fever, marasmus and chronic abscesses. The symptoms in severe cases commenced with pain in the limbs, langour and lassitude, and a sense of oppression at the precordia, suc-

ceeded by vomiting and high arterial excitement—the eruption (in two instances occurring in private practice) appeared on the 2d day, and was followed by a very imperfect diminution of the fever, a total or well-marked subsidence of which was not observed before the 6th or 7th day. In less severe cases there was no vomiting, neither the appearance of the eruptions early, but on the 3d day with subsidence of the fever; but no sooner were the pustules in a state of maturation on the 10th or 11th, than there was a return of fever, accompanied in some with diarrhœa, in others with bronchitis, which generally proved fatal. But the most remarkable feature of the epidemic was its not sparing those who had it once, nay twice before. Hence our attempts to establish vaccination turned out at last to be total failures, as neither this nor previous inoculation proved any preventive against the disease."

The following shrewd observation is deserving of notice in this place:

"No sooner did this epidemic (Small Pox) run its course, than another still more formidable, (Cholera) appeared about the latter end of May. It attacked people of all ranks, of every age and sex, and at all hours—the noonday was as favorable to it as the midnight. The symptoms denoted *extreme malignancy of the disease:* speedy and sudden depression of the circulating and nervous functions and consequent collapse was observed to come on almost simultaneously with the ushering in of purging and vomiting, &c."

The neglect of vaccination at the early outset of these Institutions cannot be wondered at. The cure

of present suffering and pain will always be a primary consideration to the prevention of future possible disease, both with Medical men and with the unreflecting multitude. I have no doubt that the attention of the gentlemen engaged in these interesting duties would be devoted as zealously and successfully to the introduction and establishment of vaccination among the people as it has been to the uses of skilful Surgery and Medicine, if the call were made for it.

The following extracts from the public letter of a distinguished Civil Officer bear such striking testimony to the success and usefulness of these Charities, and to the growing estimation in which they are held,—and exhibit such a just appreciation of the extensive uses to which their agency may be applied under an extended system of management, that it affords me great pleasure to be enabled to make this public :

From R. H. Clarke, Esq.,

Magistrate, Barielly,

Dated 23d June, 1843,

To W. J. Conolly, Esq.,

Commissioner, Rohilcund Division.

10. As it may possibly be expected of me to enter into a more circumstantial account of the benefits which are anticipated to follow the establishment of these institutions, I beg to enumerate some of those which appear the most prominent.

11. The population of the district, agreeably to the last census in 1840-41, amounted to 8,98,669 souls, of whom 41,806 inhabit the five unhealthy Mehals to the North.

12. I wish it were in my power to exhibit a correct abstract of the number of deaths from Small Pox and other diseases during the year 1842-43, but in the first place my sources of information extend only from August 1842 to April 1843; and secondly, I have too much reason to believe that from the difficulty in obtaining accurate accounts on a newly broached subject, the statement received falls short considerably of the truth, and I shall therefore content myself with merely here observing that 2,663 persons were carried off by Small Pox during a period of nine months according to the Returns, which, as before stated, are believed to be much under the mark —146 by snakes, and 237 by accidents of various kinds.

13. Small Pox has raged with intense violence during the past year, nor indeed is the contagion even now extinguished in many places in this part of the country.

14. Few of the people know the value of vaccination in the interior of the District, and even those who do, are too apathetic to give themselves trouble to bring their children long distances for that object, but by the establishment of a Dispensary in each Tehsildaree Division, and by thus preserving a depot of vaccine matter always at hand, the means will be afforded of gradually diffusing it among all classes of the inhabitants with the provision and continuity that cannot fail to give effect to those benevolent intentions of Government which have been hitherto nullified and baffled owing to the absence of any efficient organized machinery, as may be gathered from the simple fact that only 484 successful cases occurred

in this District in 1842 among a population of nearly 900,000.

15. It is also worthy of remark that we possess no means at present of prosecuting any satisfactory enquiry into the sanatory condition of the people, a subject which is annually acquiring a higher interest. The proposed Institutions will assist us in obtaining the requisite data on which it may be in the power of Government to form some opinion of the physical depression or otherwise of its subjects, and by the improvement of our knowledge to discover those physical evils which bring misery on the people, that appropriate remedies may be applied, if possible, for their removal. Nor will it be denied that a measure which impresses the people with a conviction that Government feels a sympathy for their sufferings and a solicitude for their welfare is one of a high moral importance.

16. In regard to the results we may be permitted to draw a happy presage from the almost unexpected success that has attended the establishment of the Sudder Dispensary in the town, which in four years ending June 1842, conferred Medical relief on 31,821 patients, while the last year will undoubtedly exhibit even a larger number than either of the four previous years,* thus affording incontestible proof of the esteem in which the institution is held by the public and how well able they are to appreciate the superiority of European Medical Science.

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* Since ascertained to be near 12,000 persons, or about 50 per cent. more than the average of the last four years.

17. In further illustration of this I beg to annex in the Appendix a statement of some of the patients, taken from the Register, to show the journeys that the sick have undertaken to avail themselves of those blessings that the Institution holds out, but it is necessary to bear in mind that it is only those who suffer acutely or are near death's door that come such long distance to obtain aid; how many hundreds, nay thousands remain (from necessity generally) at their homes, bearing up as well as they can under their sufferings to avoid the expense and discomfort of being separated four or five days journey from their families at a time when they most require their services? In behalf of all these the boon proposed will, I hope, be considered as having a just and strong claim on the favor of Government.

18. It may naturally be objected however that these very reasons apply with equal force and cogency to other parts of the country, and that the question must therefore be entertained as one of State expediency and policy, but in reply to this it is humbly submitted that the scheme may at present be viewed altogether as an experimental measure, that a sufficient number of zealous and intelligent Native Medical Officers could not be found to take charge of such Institutions if extended simultaneously over the country, and that although undoubtedly where the circumstances are similar, other Districts have in every respect equal claims on the favor and countenance of Government as the people of this Zillah, still time may be allowed for bringing a newly introduced system to maturity and testing its practical results by a probationary term.

19. I conclude this letter with the hope that you will treat such imperfections as may occur to you in the proposition now made with indulgence, and that the aid of your valuable support may be bestowed in recommending it to the favorable notice of Government, while I would also again bring to your attention the claims of Hursook Rao, whose petition gave rise to the present correspondence, and to recommend that he be appointed as suggested in my former letter No. 93, a Superintendent of one of the Branch Dispensaries.

Vide Report to Sessions Judge No. 5 of 3d February 1842.

(Signed) R. H. CLARKE,
Magistrate of Barielly.

Notwithstanding the eclat which attended the establishment of these Dispensaries in the large provincial towns, and the promise of extensive general utility which they early afforded, they were from the first considered by the Governor General as merely conducive to the successful introduction of Vaccination, and were not allowed to supercede the existing arrangements, nor to interfere with them in any way. The vigilance of Government continued however to institute fresh inquiries into the causes of failure, and want of success, while the now almost despairing efforts of the Medical Board were apparently limited to the maintenance of things as they were, and a feeble endeavor to prevent matters from becoming worse.

The following letter addressed to the Governor General, in May 1841, states the views of the Board on the subject at that time:

My Lord,—We do ourselves the honor of acknowledging a despatch from Mr. Secretary Bushby, No. 800, dated the 21st October 1840, desiring us to review our Annual Vaccine Report for 1839-40, and to specify at what stations the number of persons vaccinated shall appear to be inadequate to the expenditure incurred on that account, and whether the paucity of the cases be from the remissness of the Officers to whom the duty is entrusted, or occasioned by circumstances not in their power to overcome.

2d. We regret to say that we cannot report favorably of the progress of this valuable remedy. In some quarters it has almost completely failed, and in others a large proportion of the subjects have been vaccinated by the Native Establishments, and as most of these must have been performed beyond the control of the Surgeon, small as the number is, we are unable to place much confidence in its accuracy.

3d. We beg leave, however, to assure your Lordship, that we do not consider the paucity of cases to have proceeded from remissness on the part of the Superintendents, but that it is to be ascribed to the disinclination of the Natives themselves who partly from apathy and partly from prejudices cannot be prevailed upon in any considerable numbers to submit to vaccination.

4th. As far therefore as the Native community is concerned, we believe that the prophylactic has scarcely in any perceptible degree established itself in their estimation. Something however is due to the Christian population who eagerly embrace its advantages, and we are also induced to believe that as knowledge increases the Natives will not continue

blind to their own interests in rejecting this simple means of protection against so formidable a disease as Small Pox.

5th. Under these circumstances, we are not prepared to recommend the abolition of the Vaccine Establishment, and to give it a chance of success, it can scarcely be reduced to a lower scale than that now existing. We would therefore suggest that for the present no reduction take place, and we have directed the Superintending Surgeons of Divisions to make further inquiries regarding it, the result of which we shall do ourselves the honor of communicating for your Lordship's information.

(Signed) T. SMITH,
1*st Member Medical Board.*

A comprehensive and searching inquiry was again commenced into the comparative qualities of the lymph employed in the different Stations and Provinces of the Bengal and the Agra Presidencies; and Special Reports were called for from all the Superintending Surgeons relative to the qualities of the lymph, the obstacles in the way of its diffusion, the efficiency of the Establishments, the zeal of the Officers, and the dependence to be placed on their Reports.

The replies to the Board's Circular letter of 14th September 1841, comprehending detailed Accounts of the actual state of Vaccination at the present time throughout this Presidency, together with the mature views and opinions regarding it of the most experienced and best informed Members of the Profession, deserve permanent record, and are subjoined in an Appendix, viz.

Report from Dacca Division, Suptg. Surg. Lamb.
2. Do. „ Barrackpore, do. „ Findon.
3. Do. „ Benares, do. „ Halliday.
4. Do. „ Neemuch, do. „ Mellis.
5. Do. „ Agra, do. „ King.
6. Do. „ Cawnpore, do. „ Atkinson.
7. Do. „ Saugor, do. „ Hough.
8. Do. „ Dinapore, do. „ Marshall.
9. Do. „ Kurnaul, do. „ Panton.
10. Do. „ Meerut, do. „ Playfair.
11. Do. „ Presidency, do. „ Tweedie.

Upon receipt of these discouraging Reports the following letter was addressed to the Medical Board, whose reply, couched in very decided terms, would appear to have taken the Government somewhat by surprise, since it led to the instant abolition of the Provincial Depots, a Resolution to which the Governor General adhered notwithstanding repeated remonstrances.

From G. A. Bushby, Esq.,
Secretary to Government of India,

To the Medical Board.

Dated 16th February, 1842.

Gentlemen,—I am directed to acknowledge the receipt of your letter and its enclosures, dated the 22d December last, containing a Return of persons vaccinated in all the Divisions of the Bengal Presidency, from April 1840 to March 1841, and the Reports of the several Superintending Surgeons commenting on the restricted spread of vaccination in certain zillahs within their respective Superintendencies.

2d. The Governor General in Council regrets to observe that the prejudices and feelings of the people in many Districts have been so much opposed to the diffusion of vaccination. But as these causes may be expected to be gradually removed as the population becomes sensible of the advantages of the prophylactic, His Lordship in Council trusts that a zealous perseverance on the part of the Superintendents in their prosecution of the measures of conciliation and persuasion, repeatedly recommended by the Government and the Board will, more especially in large Cities, and particularly in those in which Dispensaries are maintained, eventually overcome the obstacles that still exist to a proper appreciation of its benefits. In other places, particularly in thinly peopled Districts where the sole dependence is upon itinerant vaccinators, on whose exertions there is little check, and whose labors have been and promise to be but of very little benefit, the Board may see good to reduce the Establishment.

2d. A recent application from the Civil Surgeon of the 24-Pergunnahs to be placed in point of allowance for superintending vaccination on the same footing with the Civil Surgeons of Moorshedabad, Dacca and Patna, having brought the subject under the review of Government. I am directed to observe that the Provincial Vaccine Depots were originally established at the several seats* of the Courts of Appeal, which were then considered the principal Civil Stations; but the changes that have since taken place in the administration of the Provinces have diminished the importance of some of the Stations

* Moorshedabad.
Dacca,
Patna,
Benares,
Bareilly,

and enhanced that of others. Besides it is evident from the wording of the Resolution of the Supreme Government, dated the 20th February 1835, that in sanctioning the existing plan, the maintenance of only a General Superintendent at the Presidency was contemplated. That plan constitutes every Medical Officer a Superintendent of the Vaccine operations conducted in his District, and where the salary is only Rupees 300, assigns an allowance for the performance of the duty, and as fresh lymph can always be supplied from the Depot at the Presidency, the advantage of continuing the Provincial Depots seems questionable. But as these have been permitted for a length of time to remain undisturbed, and the Board may be aware of reasons for maintaining them not known to the Government, I am to request your sentiments generally on the subject.

(Signed) G. A. BUSHBY,
Secy. to the Govt. of India.

FROM THE MEDICAL BOARD,

TO THE GOVERNOR GENERAL OF INDIA IN COUNCIL.

DATED 15TH MARCH, 1842.

We do ourselves the honor of acknowledging Mr. Secretary Bushby's Despatch, No. 300, dated 16th ultimo, and with advertence to the 3d para. wherein we are desired to state our sentiments as to the advantage of keeping up the Provincial Vaccine Depots, we beg respectfully to refer to our letter No. 544, dated 22d December last, where in the 5th para. we give it as our decided opinion that Calcutta and the Hill Provinces are *the only places* where we should

look for successful vaccination, and to this opinion we beg to say that we still adhere.

From H. V. Bayley, Esq.,
Deputy Secretary to the Government of India,

To the Medical Board.

Dated 20th April, 1842.

Gentlemen,—I am directed to acknowledge the receipt of your letter No. 778, dated the 15th ultimo, and to inform you that under the circumstances stated, the Hon'ble the President in Council directs the abolition of the allowances attached to the appointment of Superintendent of Vaccination at the Stations of Moorshedabad, Dacca, and Patna.

(Signed) H. V. BAYLEY,
Dy. Secy. to Govt. of India.

From G. A. Bushby, Esq.,
Secretary to Government of India,

To the Medical Board.

Dated 22d June, 1842.

Gentlemen,—I am directed by the Hon'ble the President in Council to acknowledge the receipt of your letter and its enclosures, dated the 6th ultimo, recommending that notwithstanding the abolition of the Provincial Vaccine Superintendencies at Dacca, Moorshedabad, and Patna, the allowance of Rupees 100 per month, hitherto granted to the Civil Surgeons of those Stations may be continued.

2d. His Honor in Council observes that by the Resolution of Government, dated the 20th February 1835,

the annual allowance of Rupees 40,000 per annum, sanctioned by the Hon'ble the Court of Directors for the diffusion of vaccination was authorized to be distributed—1st, To Assistant Surgeons at Civil Stations—2d, To the Superintendent of Vaccination and his Establishment at the Presidency, and 3d, To Native Vaccinators. By the Resolution of Government of 22d July 1835, the Vaccination allowance of 20 Rupees a month to Medical Officers at Civil Stations was restricted to cases where the salary of the Assistant Surgeon did not exceed 300 Rupees. It is evident therefore that the maintenance of only one Superintendent at Calcutta was contemplated in 1835, and under the admitted inutility of the Provincial Vaccine Depots, the Vice President in Council cannot see the propriety for any longer burthening the Revenues with a charge which is not only unnecessary, but which appears to have been continued through inadvertence.

(Signed) G. A. BUSHBY,
Secy. to Govt. of India.

The inquiries of Government were not now confined to the Bengal and Agra Provinces; communications were interchanged between the Governments of Bombay and Madras, relative to the qualities of the vaccine lymph propagated in the hill stations, and in the sandy plains of these Presidencies, it being supposed that at the former from their elevated situation and cooler climate the virus might be maintained in greater purity; while the popularity of the antidote in some of the Madras Districts was suggestive of most unflatering comparison with its decline and failure in Bengal.

From Bombay the Superintending Surgeon of the Presidency Division after describing the climate and population of the Mahableshwur Hills reported on the 9th June 1841, that "owing to the limited population in the neighbourhood of Malcolm Perth the number of children vaccinated is very small, as will appear from the Monthly Returns which have lately been forwarded from this office.

"2d. During the last month only eleven children were vaccinated, all of whom I saw, and with the exception of one which failed, the vesicles were good, but in no respect differing from a well developed vesicle in the low country,—one or two were of larger size than those generally observed, but this depends much on the manner in which the operation is performed.

"3d. Dr. Murray states that in any given month he could vaccinate more than have yet been done, but in that case the number of subjects would be exhausted and the virus lost, he therefore restricts the Assistant to two or three per week, and *by this means alone* can the lymph be retained on the hills.

"4th. It is intended to keep the Assistant on the hills during the ensuing monsoon for the purpose of vaccinating any children that are procurable in the small villages on the range, and of ascertaining whether vaccination can be successfully carried on, the lymph remaining unimpaired amidst the deluge of rain which falls in that country.

"In October or November I shall do myself the honor of submitting a final report on this subject."

(Signed) JOSEPH GLEN,

Supg. Surgeon, P. D.

The same Officer subsequently reported to the Medical Board of Bombay in June 1842.

"The Assistant Vaccinator was appointed in November 1840, but did not join till February 1841, since that date 250 children have been vaccinated by him, giving an average of about four every eight days. This number is not greater than is required to ensure a continuance of the disease on the spot, and altogether inadequate for the purpose of affording a regular supply of lymph to the Divisional Vaccinators in the low country. It is probable that a greater average than is here shewn could during a few weeks have been vaccinated, but this on account of the limited population would soon have exhausted all the subjects and have occasioned a failure of lymph on the hills.

3d. It is further to be noticed that the climate of Mahableshwur for four months of the year renders it impracticable to carry on vaccination there, and during last monsoon the Vaccinator was chiefly employed in the low country. From this circumstance the chain of Hill Vaccination would be annually broken, and the renovating effects which the climate is expected to produce on the lymph destroyed.

4th. In the 2d para. of my letter dated 9th June 1841, I reported that the vaccine vesicle on the Hills did not seem to me to differ materially from or to be superior to the vesicles of the plains, &c., I have now the honor to annex a letter from the Superintendent of Vaccination at the Presidency, dated 3d ultimo, reporting the result of an experiment made at my request of vaccinating children in Bombay, with lymph obtained from Mahableshwur.

5th. As from this Report it appears that the vaccine disease produced by Hill lymph does not differ from what is now existing here, and as the vesicle at Mahableshwur is not in any way superior to the vesicle of the low country, I am of opinion that it is useless to continue the experiment any longer even if the population of the Hills were sufficiently numerous to afford a full and regular supply of lymph."

(Signed) JOSEPH GLEN, *P. D.*

(Enclosure.)

To Joseph Glen, Esq.,
Superintending Surgeon P. D.,

From Surgeon J. McLennan,
Superintendent of Vaccine.

Sir,—"I have the honor to forward a Return of persons vaccinated with lymph received from Mahableshwur in the months of January, February, March and April, from which it will be apparent that in five cases out of nineteen it was ascertained to have succeeded.

In these cases the vesicles were in every respect similar to those resulting from vaccination with lymph of the plain, but if in any respect different it was merely that the vesicles were rather smaller."

(Signed) JOHN McLENNAN.

The valuable and interesting information received from the Medical Board at Madras was transmitted by the Governor General to the Bengal Board on the 13th October 1841, with the following letter:

From G. A. Bushby, Esq.,
Secretary to Government of India,

To the Medical Board, Calcutta.

Dated 13th October, 1841.

Gentlemen,—I am directed by the Right Hon'ble the Governor General in Council to transmit to you the accompanying copy of a Report from the Medical Board at Madras, on the progress of vaccination in that Presidency, and to request that you will call upon the Superintendent General of Vaccine Inoculation at Calcutta, for any remarks or observations he may have to offer in explanation of the striking disproportion in the number of persons vaccinated in Bengal and Madras, and of the causes which in his opinion may have conduced to the great success at Madras. The results of the last year are noted in the margin for reference, but the comparison can be carried back for the last five years.

2d. In forwarding the above explanation for the information of Government I have been desired to request that the Board will notice any difference that may exist in the system pursued at the two Presidencies, suggesting any alteration that may occur to them as likely to prove advantageous; and in stating their concurrence or otherwise in the views of Dr. Stewart, the Board will submit their own sentiments as to the particular causes which have operated against the prophylactic attaining its deserved value in the estimation of the Natives of Bengal and the N. W. Provinces.

(Signed) G. A. BUSHBY.

STATE OF VACCINATION IN THE MADRAS PRESIDENCY.

From G. PEARSE, Esq.
Secretary Medical Board at Madras,

To the ACTING CHIEF SECRETARY to GOVERNMENT.

Dated F. S. George, the 16th Sept. 1841.

In compliance with the order of Government in the Public Department, No. 805, dated 14th instant, I have the honor, by order of the Medical Board, to submit the report called for by the Government of India, respecting the progress of vaccination under this Presidency, and the numbers vaccinated annually, with an account of the estimation in which the prophylactic is held by the population, and of the proceedings of the Native Vaccinators, as regarded by the Medical Officers under whose observation and superintendence they are employed.

2. Vaccination which was first introduced into India under the auspices of the Right Hon'ble Lord Clive, in the year 1802, has been fully established at this Presidency for a period of 38 years, and as considerable changes and improvements have taken place in the Department from time to time, the principal of which have been substituting a fixed rate of monthly pay, for the Native Vaccinators, in place of Head Money according to the numbers vaccinated, it appears to the Board, that the objects of the enquiry by the Right Hon'ble the Governor General in Council will be fully answered by submitting a detailed statement of the system under which the Department is at present conducted, the measures in force to extend the blessing of vaccination to the population generally, and to insure the efficient performance of the duties of the native practitioners.

3. The following Extracts from the Regulations (to which is annexed a numerical statement of the Vaccine Establishment, and of the number of persons annually vaccinated for the last 10 years) shew the manner in which the duties of the Department are conducted.

'The Department of vaccination is conducted by the Superintending Surgeons of Divisions, subject to the immediate authority and control of the Medical Board.

'The Medical Officers specially nominated by Government as Local Superintendents of Vaccination at the Stations of Circuit and Zillah

Courts and other fixed situations, together with the establishments of Native Vaccinators, are under the immediate authority of the Superintending Surgeons of Divisions, in all matters relating to vaccination. The Local Superintendents correspond with them, and submit to them their Monthly Reports, for the information of the Medical Board.

'It is the duty of the Local Superintendants to practise vaccination themselves, and to promote its diffusion amongst the native population by every means in their power—they superintend the operations of the Native Vaccinators, and are required to encourage and stimulate them to exertions ; to afford them the atmost possible facility, while they are not to neglect to keep a strict and vigilant watch over them; nor to omit any practicable means of *checking*, and verifying their Monthly Registers, and Reports. For these purposes, as well as by examining the nature and character of the disease kept up to judge whether the virus be genuine or not, occasional personal inspection is absolutely necessary. It is therefore to be considered as an essential principle of the duty of superintendence, that the Local Superintendents shall from time to time personally inspect the operations of the Vaccinators, in whatever parts of their respective Districts they may be employed, and it is competent for the Superintending Surgeon, under the authority of the Medical Board, to direct the performance of this duty when not interfering with any other of a more urgent description.

'It being desirable in many respects, and especially in the ultimate view of devolving on the natives themselves the preservation of the vaccine disease, and trusting its general use and diffusion to their unaided exertions, that the practice should fall into the hands of the native practitioners, such only are to be selected to fill the place of Vaccinators. An exception, however, may be made to this rule in favor of the sons or immediate relations of old Vaccinators now in employ, and of approved zeal and ability ;—the Vaccinators are to be selected with strict reference to the castes and description of natives amongst whom they are to be placed, and whenever practicable, should belong to the country.

'Vaccinators are appointed or removed under the authority of the Superintending Surgeon, with the sanction of the Medical Board ; and no Local Superintendent is to remove, or appoint, any Vaccinator of his own authority, nor on any pretence, to employ them as Dressers or Medical Servants. When a Vaccinator is accused of misconduct in his public capacity, or of any offence in his private character affecting

his eligibility to hold a public office, he should be brought by the Local Superintendent before the Magistrate, or Zillah Judge, as the case may be, in all instances where the offence alleged comes fairly under the cognizance of legal authority; the decree or sentence thereupon will be communicated to the Local Superintendent, for the information of the Superintending Surgeon and the Medical Board. But when applications or objections involve considerations merely of a professional nature, the circumstances are to be submitted to the Superintending Surgeon.

'As an encouragement to the poorer classes of natives to come forward with the children to be vaccinated at Public Depôts, and thereby to secure an unfailing supply of genuine vaccine virus by an uninterrupted succession of inoculations under the immediate observation of the Superintendent, Government has sanctioned the gratuitous issue of rice to such subjects at the Presidency, Masulipatam, Trichinopoly, and Tellicherry;—Rice for this purpose is furnished by the Commissariat.

'As the general and successful practice of vaccine inoculation is an object of great public interest; and as the Collectors of Revenue are peculiarly enabled by their local knowledge, their authority and their public servants, to encourage this practice, and to detect fraud or neglect of duty on the part of the Native Vaccinators, these authorities are required to promote, by every means in their power, the propagation of this valuable discovery.

'The Local Superintendent will accordingly furnish the Collector of the District with a nominal list of his Establishment of Vaccinators, stating in what Talook or Village each is employed; and he will also notify to the Collector such changes in these respects as may from time to time take place. It will then be the duty of the Collector, by means of his public servants, to observe the conduct of these people, and to explain to the inhabitants, as occasion offers, the time of their occupation. He will cause the Tahsildars and Village Curnams to make themselves acquainted with the proceedings of the Vaccinators, and to countersign the monthly registers of inoculations kept by them, in proof of their veracity.

'These Registers thus countersigned and certified being received by the Local Superintendent, he will prepare from them an Abstract Return for transmission to the Superintending Surgeon, copy of which he will likewise furnish to the Collector. The original Registers and Reports of the Vaccinators are then to be placed amongst the public records of the Collector's Cutcherry in order that reference may be had

to them at any future time should occasion require, and Collectors of Revenue are hereby accordingly required to receive and preserve them.

VACCINATION ESTABLISHMENT.

Stations.	Local Superintendent.	Number of Vaccinators.	Stations.	Local Superintendent.	Number of Vaccinators.
Madras, ...	3	13	Brought over,...	19	93
Poonamallee, ...	1	4	Coimbatore, ...	1	4
Chingleput, ...	1	6	Dindgole,.....		4
Cuddalore, ...	1	4	Madura, ...	1	4
Verdachellums, ...		4	Ramnad, ...		4
Vellore, ...	1	4	Tinnevelly, ...	1	4
Chittoor, ...	1	8	Cochin, ...	1	4
Nellore and Ongole,...	1	6	Travaneore, ...	1	4
Guntoor, ...	1	4	Onore,.....	1	4
Ganjam, ...	1	3	Mangalore, ...		
Vizagapatam, ...	1	5	Cannanore,.....	1	4
Ingeram Madepollam,	1	4	Tellieherry, ...	1	4
Rajahmundry, ...	1	4	Calicut, ...	1	7
Masulipatam, ...	1	4	Angadepooraud, ...		4
Negapatam,.....	1	4	Bangalore, ...	1	3
Combaeonum, ...	1	4	Mysore Province, ...	1	4
Tanjore, ...	1	4	Cuddapah, ...	1	1
Trichinopoly, ...	1	4	Bellary, ...	1	4
Salem, ...	1	4	Kurnool,.....	1	2
Carried over,...	19	93	Total,.....	33	162

Table exhibiting the Number of Persons Vaccinated from the year 1831 *to* 1840 *inclusive.*

Years.	Christians.		Hindoos.		Mahomedans.		Total.		Grand Total.*	Totals as Corrected by D. S.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.		
1831, ...	4,582	3,828	47,919	39,327	5,511	3,364	58,012	46,519	1,04,531	2,09,062
1832, ...	4,405	3,636	45,872	37,031	5,168	3,281	55,445	43,948	99,393	1,98,786
1833, ...	4,456	3,817	52,788	44,221	5,083	3,384	62,327	51,422	1,13,749	2,27,498
1834, ...	3,848	3,334	43,990	36,342	5,104	3,382	52,942	43,058	96,000	1,92,000
1835, ...	3,273	2,736	41,083	33,955	5,039	3,182	49,395	39,873	89,268	1,78,536
1836, ...	3,501	2,928	41,383	34,232	4,873	2,785	49,757	39,945	89,702	1,79,404
1837, ...	3,371	2,976	40,951	33,141	4,650	2,593	48,972	38,710	87,682	1,75,364
1838, ...	4,145	3,340	45,482	36,774	5,530	3,478	55,157	43,592	98,749	1,97,498
1839, ...	4,293	3,462	58,266	46,331	6,740	3,973	69,308	53,766	1,23,074	2,46,148
1840, ...	4,408	4,426	62,675	50,392	6,133	3,856	73,216	58,674	1,31,890	2,63,180

* Note.—Sic in orig.—D. S.

With reference to the opinion* expressed by the Superintending Surgeon Southern Division, which has attracted the attention of the Right Honorable the Governor General in Council, I am directed to state, 1stly, That taking into consideration the great extent of the District of Combaconum, the Board were induced to recommend the addition of two Vaccinators to the Establishment of the Southern Division; and 2ndly, That with a view of preventing Native Vaccinators from falling into careless, or negligent habits, which they are apt to do when away for any length of time from the immediate control of the European Officers, they occasionally remove from one part of their Districts to another, so that each individual may come under the surveillance of the Local Superintendents in turn, and they are likewise strictly prohibited under pain of dismissal from the service, from engaging in trade or agriculture. In cases of misconduct or neglect of duty, the Vaccinators are either subjected to dismissal from the service, or stoppage of pay, the latter punishment is however but seldom resorted to.

* That the duty imposed on Vaccinators generally (if they perform it honestly, which is very doubtful) is greater than they can efficiently accomplish.

Superintending and Executive Medical Officers having been called on by the Board in 1838, to encreased exertion in extending the benefits of vaccination, a reference to the foregoing Table shews that a progressive increase in the numbers annually vaccinated has since taken place, and in the year 1839, instructions were issued by the Board directing that the entire of the Medical Subordinates, whether in the Civil or Military Departments, should in future be obliged to qualify themselves in a knowledge of the disease with a view to its more extensive dissc-

No. 1290.

CIRCULAR.

To Superintending Surgeon

SIR,—It appears to the Medical Board that the benefits of vaccination may be much extended, particularly in the more remote parts of Districts by means of the Medical Subordinates, attached to Collectors and Sub-Collectors, without interfering with their ordinary duties, I am directed to request with a view to their being employed in its dissemination, that you will ascertain if the Subordinates in your Division, whose names are annexed, are acquainted with the nature of the vaccine disease, and the

mination ; In addition to the labours of the regular Vaccination Establishment, the prophylacted is regularly kept up in the Army, and amongst its numerous followers, every Soldier, or Sepoy, not having unequivocal symptoms of having had either Small Pox or Cow Pox being vaccinated when first entertained ; and the families are encouraged to bring forward their children. The system in operation throughout this Presidency, may therefore be confidently stated to be in every respect efficient, and to be conducted with vigour.

Medical Officers in charge of Vaccine Departments be called on to take every opportunity of communicating a knowledge of the disease and the method of inoculating to such of them as require instructions, and the Board desire that vaccine lymph be supplied to them when required ; and that Annual Reports of persons vaccinated of the form given at page 158 of the Code of Medical Regulations be furnished to Local Superintendents by them on or before the 15th January in each year.

2. I am further directed to acquaint you the Board consider it essential that the Medical Subordinates of every grade throughout the Service, should understand the nature of the vaccine disease and mode of operating, and that it should form a part of the duty of Medical Officers to communicate instruction on this important subject to the Subordinates serving under them.

3. The Annual Returns of Subordinate Medical Servants are in future to state under the head of professional qualifications, that the individuals are acquainted with vaccination, or otherwise, as the case may be.

(Signed) G. PEARSE,
Secy. Medical Board.

6. As regards the estimation in which vaccination is held by the population of the Madras Territories, I ami nstructed to state, that as the operation of inoculating with the matter of Small Pox has been practiced throughout various parts of this Presidency, by Native Doctors, from time immemorial, and as the modern operation with the Cow Pox virus is so perfectly similar to that to which they have been always

accustomed, the natives see no distinction between the two diseases, and consequently have no prejudice against vaccination. In some of the Regiments of Native Cavalry and Horse Artillery, the men being chiefly Mahomedan, are more unwilling, perhaps from their habits of privacy, to bring their families forward for the purposes of vaccination than other classes of the people ; with this exception, the only other difficulty to be contended against in this part of India is the general apathy of the natives regarding matters of the kind, except whan under the influence of fear, on the breaking out of Epidemic Small Pox, and the Board are happy to state, they have every reason to be satisfied with the result of the system of vaccination at this Presidency where it has proved a blessing to hundreds of thousands of the inhabitants.

7. One other subject only remains to be noticed, namely, the view which the Medical Officers take of the proceedings of the Native Vaccinators employed under their Superintendence, on this point it will be sufficient to observe that the Local Superintendents have every facility afforded them of punishing neglect of duty by representations to the Medical Board through the channel of their respective Superintending Surgeons ; and although complaints of misconduct are not unfrequent, especially against Vaccinators, employed at a distance from the European Officers ; the general conduct of the Native Vaccinators in a large majority of instances is as satisfactory as can perhaps be expected from persons, the faithful performance of whose duties must, notwithstanding the several checks over them (before enumerated) in a great measure be voluntary.

I have, &c.

(Signed) GEO. PEARSE, *Surgeon*,
Secy. Medical Board of Fort St. George.

The above letter gives a good view of the system followed in the Madras Presidency, and the following are the remarks thereon of the Bengal Board.

From the Bengal Medical Board,

To the Governor General in Council.

Dated 22d December, 1841.

My Lord,—We do ourselves the honor of acknowledging Mr. Secretary Bushby's despatch, dated 13th

October last, transmitting copy of a Report from the Medical Board at Madras on the progress of vaccination at that Presidency, and requesting us to call upon the Superintendent of Vaccination at Calcutta, for any remarks he might have to make upon the striking difference in the number of persons vaccinated in Bengal and Madras, and desiring us to submit such suggestions as might tend to introduce this valuable prophylactic to the favorable consideration of the native community.

2d. In reply we beg to refer your Lordship to Dr. Stewart's letter herewith forwarded, and we concur in opinion with him that although less prejudice and more facilities in carrying on vaccination exist under the Madras Presidency we are not inclined to give more credence to the correctness of the numbers said to be vaccinated by the natives than to the reports of the same class of persons on this side of India.

3d. As connected with this subject we beg respectfully to refer to our despatch to your Lordship's address dated 3d May last in reply to Mr. Bushby's letter dated 21st October 1840, when we expressed our sentiments fully regarding the impossibility of establishing the general use of vaccination among the natives of this part of India.

4th. In that letter we expressed our intention of calling upon the different Superintending Surgeons—

1st. To report their sentiments on this important subject. These Reports we have now the honor of forwarding, and your Lordship will perceive that with scarcely any exception all the Superintending Surgeons concur in the unfavorable opinion formerly

come to by us with regard to the spread of vaccination.

5th. Dr. Stewart seems to think that it might be advantageously prosecuted in the large cities as formerly attempted. Our own personal experience leads us to a different conclusion, and the only places where we would expect success are Calcutta and some of the Hill Provinces, such as Mussoorie or Simlah. Joudpore is reported to present a favorable field for the exertions of Vaccinators, and with a view to carry it into effect Mr. Doyle has lately been appointed.

6th. With regard to the quality of the lymph imported last cold season by Dr. Stewart opinions vary. As for ourselves we have no doubt of its genuineness, but as we were fully satisfied of the genuineness of that formerly in use we are not inclined to attach so much importance to the introduction of it as some have done.

(Signed) T. SMITH,
Senior Member.

(Enclosure.)

FROM DR. D. STEWART,
Superintendent General of Vaccination,

TO GEORGE ANGUS, ESQ.,
Officiating Secretary, Medical Board.

DATED 6TH DECEMBER, 1841.

SIR,—I have the honor to acknowledge your letter of the 30th ultimo, requiring me to furnish for the information of Government, some explanation of the very striking difference in the number of persons vaccinated in the Bengal and Madras Presidencies,

with any remarks which my experience in the Department may have suggested as likely to be advantageous to vaccination in Bengal.

3d. I am not in possession of the Statistical information necessary to enable me to assign the local causes of failure in Bengal, or to test the accuracy of the Returns from Madras, which appear to me questionable; but the following observations which are founded on the concurrent testimony of all my correspondents in the Bengal Provinces, appear to me sufficient to account for the alleged difference. *First*—Unlike Madras, where "the natives see no "distinction between the two diseases (viz. the Vaccine "disease, and that produced by Small Pox Inocula- "tion) and consequently have no prejudices against "vaccination"—there exists among the Hindoo population of Bengal a very strong religious prejudice against it, which is further strengthened by their apathy, and dread of innovation. A partiality moreover exists in *favor of Small Pox Inoculation* founded on antient usage, and a belief that this disease operates on the bodies of young children as a depurgator of the uncleanness contracted during parturition. This latter idea is even stronger among the Mussulmans, whose faith in the humoral pathology of the Greek and Arabian Schools is a great bar to all improvement in Medicine among them. *Secondly*—It is to be observed that the Ryotwarree Revenue system of Madras which forms such a contrast to the Zemindaree system prevailing in Bengal affords to the Collectors, and the Vaccinators *employed under them*, great and direct facilities of extending the blessing of vaccination among the people. In Bengal the Civil Surgeon has to encounter, alone and unaided, the prejudices,

the superstitions and the ignorance of the native inhabitants of his Zillah Station, with whom he has little intercourse, and no personal direct influence; his Vaccinator may perhaps also extend his exertions to a few neighbouring villages or pretend to do so in order to earn his salary; while on the other hand the "Local Superintendent of Vaccination" in the Madras Presidency exercises *his* calling among a willing people, supported by the powerful influence of the Taseeldars and Village Curnams, to whom his reports are made. He may thus extend his efforts without let or hindrance to every hamlet in the District. *Thirdly*—There is beyond all doubt something in the climate of Bengal unfavorable to the maintenance and of course to the propagation of the vaccine disease. Both in the Lower and in the Upper and the N. W. Provinces, the characters of the disease invariably undergo a change during the hot weather and rains; it then becomes difficult of transmission from subject to subject, the proportion of failures is then very great, and it is not until the return of cool weather that the disease regains its true Jennerian appearance and characteristics. *Fourthly*—It is only in large towns, such as Calcutta, where there is a mixed population of Christians, Hindoos, and Mahomedans, that fitting subjects in sufficient number can be found for successful vaccination, or the influence of example can be felt in producing a general preference of Vaccination to the dangerous practice of Small Pox Inoculation, which is still permitted in India, although now made penal in England, as it has long been in Saxony and other European States.

4th. The above appear to me to be the main reasons why vaccination does not advance in Bengal

so well as at Madras. I am not of opinion that, under such circumstances, any blame can fairly be attached to the Gentlemen now engaged in vaccination, (viz. Civil Surgeons at Zillah Stations); all of whom in their correspondence with me constantly express their deep regret at the failure of their best efforts to disseminate the disease, and most of whom experience the annual necessity of seeking fresh supplies of lymph from Calcutta to meet the wants of the English inhabitants in their Districts.

5th. Being called on to submit any suggestions for the improvement of the Department which occur to me, I am bound to declare, 1st, it seems vain any longer attempting to keep up a Vaccine Establishment at the small Zillah Stations as at present— 2dly, The only places where this should be done are, I think, the large Towns, as was the case formerly. But at these it seems to me desirable, in order to recommend vaccination to the natives, that the practice of it should be *associated permanently with that of Medicine.* With this view it should be performed only at suiting times, and as publicly as possible, at Hospitals or Town Dispensaries, and under the immediate personal superintendence of the Surgeons, by the Sub-Assistant Surgeons in charge of these Establishments. I annex a Tabular Statement showing the results of this *principle* and system since its adoption in Calcutta 1836-37—

Year.	1835.	1836.	1837.	1838.	1839.	1840.
Total Vaccinated,	920	1479	4951	7267	5058	6546

3rdly, Instead of giving *rice* as an inducement to the parents to bring their children to be vaccinated as at Madras, I would propose from time to time to bestow a small sum of money (4 pice or 1 anna) on the parent who would preserve the four crusts which form on the arms of each child successfully vaccinated, and who would bring them to the Dispensary with the child for inspection. I beg leave to observe that these crusts are found to be the best mode of transmitting the vaccine lymph to a distance, and are valuable on this account. The reward therefore is not a *bribe* to the parents to have their children vaccinated, but is the price of the crusts which they take the trouble to preserve; and the principle involved in this measure is in just accordance with the liberal spirit which bestows the boon primarily upon themselves.—4thly, I think that as at Madras, all Sepoy Recruits, with their families if present, should be immediately vaccinated.

(Signed) D. STEWART.

The following is, I believe, the latest communication which has reached the Medical Board on the subject of vaccination in Bengal from the Court of Directors, and evinces the same benevolent anxiety for the more extended promotion of the prophylactic which marks all their previous instructions.

FROM T. R. DAVIDSON, ESQ.,

Officiating Secretary to Government of India,

TO THE MEDICAL BOARD.

DATED 5TH JULY, 1843.

GENTLEMEN,—I am directed by the Hon'ble the President in Council to transmit to you with refer-

From Board, dated 22d Dec. 1841, and two Enclosures.
To do. dated 16th Feb. 1842.
From do. dated 15th Mar. 1842.
To do. dated 20th Apr. 1842.
From do. dated 13th Apr. 1842.

ence to the correspondence noted in the margin, a copy of paras. 44 to 50 of a Despatch from the Hon'ble the Court of Directors No. 8 of 1843, dated the 3d May, respecting vaccination in India; and to request that your Board will have the goodness to report the measures you would recommend for giving effect to the Hon'ble Court's suggestions contained in the concluding part of the 46th paragraph in the first clause of the 47th and in the 48th paragraphs.

(Signed) T. R. DAVIDSON.

Extract from a Despatch from the Hon'ble Court of Directors, No. 8 of 1843, dated the 3d May.

(66 to 75) Also Letter dated 24th August, No. 38 of 1842, paras. 13 to 15, noticing a Report received from the Government of Madras, shewing the progressive increase of vaccination in that Presidency; also referring to Reports from the Medical Board and Superintendents of Vaccination in Bengal, exhibiting unfavorable results. The allowance of several local Superintendents abolished, and extraordinary decrease in the number of persons vaccinated at Dacca explained.

44. The state of vaccination in Bengal and the North Western Provinces contrasts very unfavorably with that in the Madras Presidency, there having been 1,31,890 cases at the latter Presidency in 1840, and only 44,046 in Bengal during 1839-40. It is stated that the Reports of the Native Vaccinators at Madras frequently cannot be relied on, as no means exist of checking the accounts in many places. But this defect must exist

to as great a degree in Bengal where the Native Vaccinators have an equal motive to send in false Returns.

45. There is an evident, and we fear an increasing repugnance to vaccination in Bengal and the Upper Provinces, with the exception of Calcutta and the principal cities where a large mixed population somewhat affected by European habits, is operated upon by European Surgeons or Natives under their immediate supervision. We are not willing to charge this repugnance to the negligence or misconduct of the Surgeons and Vaccinators; ample cause exists in the frequent failure of the operation, added to the ignorance and apathy of the people, and occasionally to their religious caste, and prejudices.

46. The climate of Bengal and the North Western Provinces appears to be less favorable to vaccination than that of Madras, where the mode of Revenue Settlement brings the Natives more frequently into connection with Europeans and renders it more easy to introduce new customs. In the former Provinces the hot season appears to be so adverse to its propagation that most of the operations fail at that period and throw great discredit on the remedy. You will therefore consider whether it may not be better on every account to desist entirely from vaccination during the hot season in those situations where numerous failures have hitherto taken place. The supply of virus would not be diminished on this account, and the Native Vaccinators might be employed in some other manner during the hot weather or engaged for the favorable season only.

47. It will also be for you to consider whether the Dispensaries which have been recently established in several Districts and the increasing number of Natives who are receiving Medical instruction may not be made available for the promotion of vaccination, and whether the Officers in the Revenue and Judicial Departments may not in the ordinary course of their business, and with little or no additional labor give aid to vaccination ; especially by announcing the progress of the Vaccinators, and the periods of their intended arrival at different localities.

48. It appears to us desirable, that you should, for the present, wholly desist from prosecuting vaccination in the Districts where repugnance to it is most strong.

49. In our Despatch of 21st November, No. 25, of 1842, paras. 19 to 23, in which this subject was last noticed, we approved of your having continued the Vaccine Establishments for another year, trusting that a more favorable report might then be received. This has not been the case; and you were fully justified in your abolition of several appointments of local Superintendents, and will no doubt see the necessity of making reductions in such other parts of the local Establishments as are clearly inoperative or inefficient, which are much more numerous than we had reason to expect.

50. The investigations into the best mode of procuring a constant supply of good vaccine matter have not yet been brought to a satisfactory result. We shall therefore continue our supplies regularly, for although what has been lately sent has failed entirely in some Districts, it has been highly successful in

others, and every means should be taken of securing a sufficiency of the best kind.

(True Extract,)

(Signed) T. R. DAVIDSON,
Offg. Secy. to Govt. of India.

CONCLUSION.

CALCUTTA, 1ST NOVEMBER, 1844.

The greater part of the foregoing pages was put together in June last, and presented to the Medical Board, at whose recommendation the late Deputy Governor of Bengal was pleased to order their publication. This was forthwith commenced, but has been delayed till now in consequence of my anxiety to complete the important Table I. by bringing down its details at all the Presidencies to the present time. In this expectation I have, however, been disappointed; but the kind assistance of the Accountant General has enabled me to continue the Financial Statement as far as it regards the Bengal Presidency, in a Supplementary Table.

I have also thus the satisfaction of publishing the following correspondence relating to a recent supply of fresh vaccine lymph transmitted overland by the Court of Directors in July last,—the genuineness of which upon its arrival and employment here in September, is vouched for by the highest Professional Authorities in this country.

From D. Stewart, *Surgeon*,
Supt. General of Vaccination.

To J. Forsyth, Esq., *Presidency Surgeon*,
Officiating Secy. to the Medical Board.

Calcutta, 16th September, 1844.

Sir,—I do myself the honor to report to the Medical Board, that I duly received from you on the 28th ultimo, a package containing vaccine crusts and lymph forwarded by the July Mail, from the Honorable the Court of Directors, which had been supplied from the Royal Jennerian Institution, London, on the 25th of June last.

On the 2d of this month I vaccined four young children and the same number on the 3d, the 4th and 5th instant, from the crusts supplied. Only two of the sixteen succeeded,* and in both of these cases there was but one vesicle arose on the arm of each child. From each of these two children I vaccined with the fresh lymph two other healthy infants on the 9th instant, and one of these children I now beg to present for the inspection of the Members of the Medical Board, this being the 7th day from the operation and the pocks mature.

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* Note.—I believe that my failure in such a large majority of trials was owing to my abuse of the crusts, the management of which I did not then understand, having seldom hitherto had occasion to employ them. I received a hint, however, from my friend Mr. J. R. Martin the following month, (along with two very fine crusts taken from his own child in London on the 1st of August, and enclosed in his letter) which was—to levigate the crusts finely, and to *dilute them largely*, using about eight or ten drops of water at least for each, *after* reducing them to pulp. I found that in this way I succeeded perfectly in every case.—D. S.

I trust that the Medical Board will, on examination of the four magnificent vesicles which this child presents, feel satisfied that we have now set up a true Jennerian Vaccine disease from which with every reasonable hope of safety and of success we may calculate, for a time at least, on the maintenance of an unexceptionable, and perfect antidote against the devastating malady which has lately visited this city.

Before however proceeding to disseminate it, to the supercession of the present stock, which you are aware has this year passed, (not without reproach) through the ordeal of a severe Epidemic Small Pox, I am anxious to have the official sanction of the Medical Board to this measure; and I respectfully request that I may be favored with their opinion regarding the genuineness of the case now submitted, and their orders accordingly.

Permit me in conclusion to observe that nothing probably will tend more to restore public confidence in the remedy, or to promote its more general adoption among the people, than such a professional guarantee for the excellence of the new lymph.

(Signed) D. STEWART.

From J. Forsyth, Esq.,
Officiating Secy. to the Medl. Board,

To D. Stewart, Esq.,
Suptt. General of Vaccination.

Fort William, 17th September, 1844.

Sir,—In acknowledging your letter of yesterday's date, I have the honor, by direction of the Medical Board, to assure you of their entire concurrence in

the estimate you have formed of the success of your operations from the stock of virus transmitted by the Honorable the Court of Directors, which was received at this office and handed to you on the 28th ultimo, and they are much gratified by the opportunity afforded them of bearing their testimony to this success, by the inspection of the vesicles on the arms of the infant you were so good as to present yesterday at this Office, which exhibited vividly the characteristic signs of the Jennerian Cowpock to be expected between the 7th and 8th day after the operation.

The Board farther desired me to express their hope that by means of the accustomed activity of yourself and the subordinates of your Department, you will quickly be in a position to renovate the preventive disease both at the Presidency, and in the Provinces subject to it, from the genuine source thus happily established, through the agency of which, they entertain with you the hope, that the distrust in the efficacy of vaccination, which has lately been gaining ground in India, will be in a great measure banished from the public mind.

(Signed) J. FORSYTH.

From J. F. Clarke, M. D.,
Inspector Genl. H. M. Hospitals,

To D. Stewart, Esqr. M. D., *Surgeon*,
Supt. of Vaccination.

Dated Calcutta, 25th September, 1844.

Sir,—Than the case of Vaccinia which you kindly invited me to witness last Sunday, nothing can be more satisfactory. It is I believe the second remove

from the original supply. I consider it peculiarly fortunate that you have been enabled to procure a stock of recent vaccine lymph so near the time most favorable to its successful trial, the approaching cool weather; You will much oblige me by affording the means of vaccination to the Medical Officers of the following Corps—H. M. 9th Lancers, 3d Foot, the 9th, 13th, 50th and 62d Regiments.

(Signed) J. F. CLARKE, M. D.

The Third Part of the present volume has been also enlarged to admit of the publication of the valuable "Special Reports on Vaccination" called for in 1841, and a number of other original documents which (subsequently to the first presentation of this Report) were obligingly placed at my disposal by the Medical Board. An excellent account of the Vaccine Establishments at Bombay has been reprinted from the Lancet of 1834; and this, together with the correspondence from the Madras Government in 1841 regarding Vaccination in that Presidency will, it is hoped, add greatly to the utility as it must to the general interest of the volume.

Mr. Shoolbred's able Report on Vaccination in Bengal 1804, and Dr. Cameron's in 1827, being now extremely scarce, have been epitomised and noticed fully, partly to evince the accuracy and to vindicate the originality of many of the early observations then made and recorded, and partly while doing so, to render henceforth unnecessary the ever recurring enumeration by Medical Officers of the well known and acknowledged obstacles and difficulties in the way of Vaccination in Bengal, and to encourage

rather, the combined earnest and patient investigation of these, in the hope of discovering ways and means to overcome them.

Table A. (page 21) has been reprinted and now exhibits the rapidly declining course of the late Epidemic, which had been confidently anticipated during the rains. At the present moment Small Pox does not exist in Calcutta.

Another Table (K.) has been added, not quite so unconnected with the subject of this Report as may at first sight be thought, being a Statement of Expences incurred on account of *Medical Charities* in this Presidency for the past five years, (not including the N. W. Provinces.)

Reviewing the whole history of Vaccination in Bengal, I fear it must be owned that its progress has been slow, that its operations have been but partially successful, and that its present state and prospects are unsatisfactory and discouraging. Neither can it be denied that public opinion has been unsettled regarding its advantages, and public confidence shaken in its efficacy and permanence as an antidote to Small Pox,—a feeling which is not confined to the common people, but prevails more perceptibly among the better informed and reflecting classes of the community, and is not without participators among the profession itself.

Under these circumstances, it appears most desirable that a commissioned body of Medical men, with a few associates from the general community, well acquainted with the native languages, prejudices, habits, &c., should undertake to investigate anew the nature and causes of this state of things in

Bengal, and to devise for the consideration of Government some new plan, or modification of the present system, which being founded upon definite and established principles, may afford some reasonable hope of greater success.

The necessity for such renewed inquiry will be deemed the more urgent when it is observed, that, far from diminishing in number, the invasions of Small Pox have of late become frequent and destructive in many Towns and Provinces of Bengal; and it may not be amiss to remark *en passant*, that such is the importance attached at the present day to the preservation and improvement of public health, that within the last few years similar Commissions to that proposed, have been nominated by the British Government to consider of the "Extension of Vaccination," to enquire into the "Health of Towns," and the "Sanitory condition of the laboring population," to revise the "Quarantine Laws," and "the Laws regarding Lunacy," &c. not to mention the organization of the office of "Registrar General," which has led to such brilliant results in a wonderfully short period.

Should such a Vaccine Commission at any time be here formed, I would respectfully claim the permission, which my long connection with the Department may perhaps be thought to justify, to suggest that an assimilation to the Bombay System might now be advantageously attempted in Bengal, upon the *principle* of combining the practice of Vaccination with the administration of Medicine to the sick poor; and this most effectually through the agency of the College Graduates, at Dispensaries, and City Hospitals, under special English superintendance.

With this view the Government Funds now appropriated to vaccination might be amalgamated with those devoted to the maintenance of Dispensaries, Lunatic Asylums, and Native Hospitals, and the whole be constituted into one Department, namely, that of "Medical Charities." Vaccination should be practised *only* in the cold season, at the Dispensaries by the Sub-Assistant Surgeons themselves in charge, while a wholesome superintending control over a certain number of these Institutions within certain limits, might be most usefully exercised by a few European Medical Officers selected from the Service-List, upon a salary adequate to the extra labor and the travelling charges they must incur.

The advantages which seem to me likely to arise from such an arrangement are the following:

1st. As regards vaccination,—It will become "known" and its "benefits appreciated" by a certain number of intelligent persons daily; and in due time will become "popular."

2nd. As respects the Dispensaries—there will be introduced greater uniformity and system in the management, the practice, the records and the accounts—and prospectively greater usefulness.

3rd. The promotion of professional intercourse between the young Medical men attached to these Institutions, which could not fail under the fostering of a zealous Superintendent to be greatly conducive to emulation in the discharge of their duties, and to their advancement in professional knowledge and skill.

4th. A fresh impetus would be given to their zeal, and a fresh interest excited in their business by each periodical visit of the Superintendent,—and new

fields of Medical Statistical Research will be opened, which, duly cultivated, will greatly benefit Medical Science and Literature.

TABLE I.

Statement of Sums expended on account of Vaccination at the Presidencies of Bengal, Madras and Bombay and in the North Western Provinces, from the year 1802-3 *to* 1835-6.

	1802-3.	1803-4.	1804-5.	1805-6.	1806-7.	1807-8.	1808-9.	1809-10.	1810-11.	1811-12.	1812-13.	1813-14.	1814-15.	1815-16.	1816-17.	1817-18.	1818-19.	1819-20.	1820-21.	1821-22.	1822-23.	1823-24.	1824-25.	1825-26.	1826-27.	1827-28.	1828-29.	1829-3
BENGAL.																												
At the Presidency, ...	...	6873 5 4	7200 0 0	8808 0 0	8808 0 0	8808 0 0	8808 0 0	8808 0 0	8731 3 2	8656 0 0	8625 8 0	8472 0 0	8472 0 0	8472 0 0	6572 0 0	6192 0 0	6158 2 0	6192 0 0	6192 0 0	6192 0 0	6192 0 0	6192 0 0	6573 5 4	6192 0 0	6192 0 0	6192 0 0	5956 4 7	6192
Dacca, ...	...	2226 10 8	3120 0 0	2860 0 0	3380 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2860 0 0	3380 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3380 0 0	2860 0 0	3120 0 0	3120
Moorshedabad, ...	...	3522 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2436 12 4	3803 3 7	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120
Behar, ...	...	2002 0 0	3120 0 0	3120 0 0	3380 0 0	3120 0 0	3120 0 0	2600 0 11	3900 1 3	2600 0 0	3120 0 0	3120 0 0	2600 0 0	3120 0 0	3900 0 0	2600 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3380 0 0	3120 0 0	2860 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0
Allahabad, ...	...	1757 4 0	3640 1 6	3120 1 7	2860 1 4	3380 1 3	2600 0 11	3900 1 3	2860 1 0	3120 1 2	3120 0 0	3380 0 0	3120 0 0	3120 0 0	3120 0 0	3120 1 1	3564 7 11	3120 1 2	3119 15 3	3119 15 3	2859 15 4	2859 15 3	3119 15 3	3119 15 3	3119 6 7	3119 12 4	3119 12	3071
Benares, ...	...	2262 1 9	2860 1 0	3380 1 2	3120 1 0	3449 4 7	4460 1 8	2860 1 0	3120 0 0	3380 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2860 1 0	2860 1 0	3120 1 2	3640 1 4	2600 0 11	3120 1 2	2080 0 9	4160 1 6	3120 1 2	3120 1 2	3119 12 4	3119 12 4	3119 12 5	3079
Furruckabad, ...	...	389 9 10	3116 13 5	3116 13 7	3116 13 5	2859 12 8	3379 12 0	3119 12 2	2340 0 0	3640 0 0	3120 0 0	2599 13 0	5215 9 3	3120 0 0	1299 14 6	3899 11 5	3119 12 4	3119 12 4	3119 12 4	3119 12 4	3119 12 4	3162 4 3	3788 6 3	3920 10 10	3379 12 0	3108 9 3	3119 12 4	2739
Cawnpore, ...	...	...	3301 10 7	3119 10 5	2859 10 11	3379 10 0	3379 10 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2860 0 0	3379 10 0	3380 0 0	2502 13 5	2745 8 3	3379 10 0	3119 10 5	3119 10 5	3119 10 5	3119 10 5	3119 10 5	2738 5 9	3119 10 5	3119 12 4	3119 12 4	3119 12 4	3037
Bhangulpore, ...	...	...	1820 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	1820 0 0	4420 0 0	3120 0 0	3184 0 0	6694 12 0	6240 0 0	3120 0 0	3380 0 0	2860 0 0	5980 0 0	6500
Agra, ...	...	...	...	2850 10 9	2859 12 8	3379 12 0	2859 12 8	3379 12 0	3119 13 4	3120 0 0	3120 0 0	3119 13 4	3119 12 0	3119 12 4	3120 0 0	2859 12 8	3379 12 0	3119 12 4	3119 12 4	3281 12 3	4319 11 1	3161 11 1	3119 12 4	1957 1 9	3502 9 0	3119 12 4	3119 12 4	3114
Bareilly, ...	...	...	...	752 15 7	3382 1 2	3378 12 10	3119 13 4	3119 13 4	3119 13 4	3119 10 3	3119 13 4	3119 13 4	3119 10 3	3119 10 5	3119 10 5	2859 10 11	3555 12 11	2935 2 6	3119 10 5	3119 10 5	3119 13 4	3119 12 4	3119 12 4	2859 12 8	3119 12 4	3119 12 4	3254
Dehli, ...	...	...	...	2469 13 2	0 0 0	3119 12 4	3119 12 4	2599 13 0	3035 14 6	2641 12 0	2079 13 7	3120 0 0	4897 12 2	3120 0 0	3120 0 0	3120 0 0	2860 0 0	3120 0 0	3120 0 0	3120 0 0	2339 13 3	3309 7 5	519 15 5	6995 6 6	7335 12 3	6060 15 4	6037 10 3	5417
Cuttack, ...	...	...	...	...	2842 10 8	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3035 14 7	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2860 0 0	3380 0 0	2600
Nagpore, ...	...	...	...	...	...	1390 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	4610 10 8	3120 0 0	2860 0 0	3120 0 0	2340
Poona, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0
Hyderabad, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3075 2 5	2985
Chittagong, ...	...	...	...	...	...	...	...	...	840 10 8	3120 0 0	3120 0 0	2860 0 0	3380 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3380 0 0	2340 0 0	3648 6 3	3120 0 0	3120
Bundelcund, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	536 0 0	3580 0 0	1200 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0
Saharunpore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	260 4 4	208 0 0	48 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0
Ajmere, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1434 12 10	574 2 0	688 15 2	688 15 2	688 15 2	688 15 2	654 12 4	669 15 9	719 15 10	714
Nurbudda, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1096 4 6	589 0 2	834 13 0	845 12 7	719 15 10	659 15 10	719 15 10	120 0 0	0
Western Rajpoot States, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1941 5 4	1629 5 4	1560 0 0	0 0 0	5000 0 0	7886 15 8	1492
Cooch Behar or N. E. parts of Rungpore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1362 0 0	0 0 0	1820 0 0	7905 0 0	3120 0 0	3120
Patna, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	260 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120
Monghyr, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3120 0 0	3120 0 0	3120 0 0	0 0 0	0
Persia, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1025 7 3	5250 12 2	3009 1 6	3012 1 11	2012
Lucknow, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	164 13 0	688 15 3	688 15 2	688 15 2	688
Saugor, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	59 15 3	0 0 0	0 0 0	0
South Behar Frontier, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4160 0 0	2860 0 0	3380 0 0	2080
Meerut, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	534 6 2	716 8 4	711
Soobathoo, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	842 0 9	612 6 5	918
Arracan, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	780 0 0	0 0 0	1380
Jubbulpore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	480 0 0	539
Amherst, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	477
Ramgur, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	780
Balasore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	600
Sandoway, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kumaoon, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sylhet, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hill Provinces, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beerbhoom, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burdwan, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoogley, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Maldah, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nuddea, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purnea, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pubna, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saurun, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ramree, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajshahye, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rungpore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahabad, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tirhoot, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lower Assam, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymunsin, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total Rupees, ...	...	19032 15 7	31298 10 6	39838 2 3	42849 3 2	48745 1 8	50446 14 11	48847 4 9	53320 0 11	62571 14 8	59865 5 7	61011 10 4	65144 5 8	61531 6 9	57194 7 4	58356 13 4	54893 14 8	55131 4 5	57156 14 1	54739 2 11	53712 8 11	61084 12 9	58705 10 11	65534 8 2	73743 4 0	81538 3 8	79484 10 8	72327
Madras, ...	1675 34 70	5108 28 52	3494 0 60	6098 22 20	7768 28 9	10916 15 19	6991 4 50	6323 14 40	21722 33 64	19933 23 71	23738 13 46	22086 2 29	21032 1 46	20144 33 46	20617 20 6	20403 7 52	68581 15 5	68799 14 8	68022 7 2	63009 15 9	63463 0 0	66214 0 1	67741 8 1	67247 4 2	63770 13 6	65824 14 0	65747 15 1	67917
Bombay, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	51592 1 3	43017
North Western Provinces, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

FORT WILLIAM,
Accountant General's Office,
The 14th August, 1837.

* N. B.—The charges in these Provinces for
are detailed under "Bengal," which Governmen
and Western Provinces up to 1833-34 inclusive.

Bombay and in the North Western Provinces, from the year 1802-3 *to* 1835-6.

0.	1820-21.	1821-22.	1822-23.	1823-24.	1824-25.	1825-26.	1826-27.	1827-28.	1828-29.	1829-30.	1830-31.	1831-32.	1832-33.	1833-34.	1834-35.	1835-36.	Total.
0 0	6192 0 0	6192 0 0	6192 0 0	6192 0 0	6573 5 4	6192 0 0	6192 0 0	6192 0 0	5956 4 7	6192 0 0	5768 13 9	6678 7 6	6212 0 0	6303 7 3	6209 10 0	6318 15 3	234213 2 2
0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3380 0 0	2860 0 0	3120 0 0	3120 0 0	2020 0 0	1920 0 0	1999 5 8	1760 0 0	1960 0 0	2005 1 0	95011 1 4
2 4	8808 8 7	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2020 0 0	1920 0 0	1920 0 0	1754 13 4	2085 2 8	2273 9 1	96615 9 0
0 0	3120 0 0	3120 0 0	3380 0 0	3120 0 0	2860 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	45 14 8	67567 14 8
1 2	3119 15 3	3119 15 3	2859 15 4	2859 15 3	3119 15 3	3119 15 3	3119 6 7	3119 12 4	3119 12 4	3071 8 9	248 12 7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	83781 8 4
1 4	2600 0 11	3120 1 2	2080 0 9	4160 1 6	3120 1 2	3120 1 2	3119 12 4	3119 12 4	3119 12 5	3079 7 11	1932 14 2	1837 3 2	1684 1 7	1990 4 10	0 0 0	0 0 0	91935 13 1
2 4	3119 12 4	3119 12 4	3119 12 4	3162 4 3	3788 6 3	3920 10 10	3379 12 0	3108 9 3	3119 12 4	2739 13 6	248 12 7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	83401 5 11
0 5	3119 10 5	3119 10 5	3119 10 5	3119 10 5	2738 5 9	3119 10 5	3119 12 4	3119 12 4	3119 12 4	3037 1 7	257 6 5	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	80617 7 10
0 0	4420 0 0	3120 0 0	3184 0 0	6694 12 0	6240 0 0	3120 0 0	3380 0 0	2860 0 0	5980 0 0	6500 0 0	520 0 0	0 0 0	124 6 4	358 13 3	287 1 0	522 7 10	94631 8 5
2 4	3119 12 4	3281 12 3	4319 11 1	3161 11 1	3119 12 4	1957 1 9	3502 9 0	3119 12 4	3119 12 4	3114 9 9	257 6 5	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	78341 15 7
2 6	3119 10 5	3119 10 5	3119 10 5	3119 13 4	3119 12 4	3119 12 4	2859 12 8	3119 12 4	3119 12 4	3254 0 4	1779 12 7	1990 4 10	1990 4 10	1684 1 7	0 0 0	0 0 0	83458 15 1
0 0	3120 0 0	3120 0 0	2339 13 3	3309 7 5	519 15 5	6995 6 6	7335 12 3	6060 15 4	6037 10 3	5417 6 11	1156 13 4	259 15 8	0 0 0	0 0 0	0 0 0	0 0 0	88097 11 5
0 0	3120 0 0	3035 14 7	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2860 0 0	3380 0 0	2600 0 0	0 0 0	780 0 0	0 0 0	0 0 0	0 0 0	50 14 0	74829 7 3
0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	4610 10 8	3120 0 0	2860 0 0	3120 0 0	2340 0 0	520 0 0	260 0 0	0 0 0	0 0 0	0 0 0	0 0 0	71260 10 8
0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	45047 6 3
0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3075 2 5	2985 7 2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	60920 9 7
0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3380 0 0	2340 0 0	3648 6 3	3120 0 0	3120 0 0	260 0 0	0 0 0	0 0 0	0 0 0	0 0 0	227 15 2	60617 0 1
0 0	1200 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	5316 0 0
0 0	48 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	516 4 4
... ...	1484 12 10	574 2 0	688 15 2	688 15 2	688 15 2	688 15 2	654 12 4	669 15 9	719 15 10	714 13 1	57 6 8	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	7581 11 2
... ...	... ...	1096 4 6	589 0 2	834 13 0	845 12 7	719 15 10	659 15 10	719 15 10	120 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	5585 13 9
... ...	... ...	... ...	... ...	1941 5 4	1629 5 4	1560 0 0	0 0 0	5000 0 0	7886 15 8	1492 11 7	1243 15 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	20754 4 11
... ...	... ...	... ...	... ...	... ...	1362 0 0	0 0 0	1820 0 0	7905 0 0	3120 0 0	3120 0 0	260 0 0	0 0 0	0 0 0	0 0 0	40 0 0	140 0 0	17767 0 0
... ...	... ...	... ...	... ...	... ...	260 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	3120 0 0	2020 0 0	1920 0 0	1920 0 0	1920 0 0	2080 0 0	2118 15 3	27838 15 3
... ...	... ...	... ...	... ...	... ...	... ...	3120 0 0	3120 0 0	3120 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	316 9 6	9676 9 6
... ...	... ...	... ...	... ...	... ...	... ...	1025 7 3	5250 12 2	3009 1 6	3012 1 11	2012 1 11	1345 14 10	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	15655 7 7
... ...	... ...	... ...	... ...	... ...	... ...	164 13 0	688 15 3	688 15 2	688 15 2	688 15 3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	2920 9 10
... ...	... ...	... ...	... ...	... ...	... ...	... ...	59 15 3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	59 15 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	4160 0 0	2860 0 0	3380 0 0	2080 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	12480 0 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	534 6 2	716 8 4	711 14 10	57 6 7	2321 3 11	0 0 0	59 11 5	0 0 0	0 0 0	4401 3 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	842 0 9	612 6 5	918 9 7	535 13 7	0 0 0	0 0 0	468 14 1	172 3 10	0 0 0	3550 0 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	780 0 0	0 0 0	1380 0 0	60 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	2220 0 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	480 0 0	539 15 10	299 15 11	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1319 15 9
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	477 0 0	0 0 0	187 12 8	450 11 3	450 11 3	450 11 0	450 7 4	2467 5 6
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	780 0 0	260 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1040 0 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	600 0 0	60 0 0	0 0 0	0 0 0	0 0 0	0 0 0	291 3 9	951 3 9
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	186 9 7	0 0 0	0 0 0	0 0 0	0 0 0	186 9 7
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	28 11 4	708 1 5	549 6 10	0 0 0	0 0 0	1286 3 7
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	130 0 0	252 0 0	252 0 0	257 4 5	891 4 5
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	143 8 6	... ...	0 0 0	0 0 0	143 8 6
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	204 10 5	244 10 5
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	281 6 1	321 6 1
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	238 6 0	278 6 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	259 14 3	299 14 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	238 12 6	278 12 6
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	177 3 1	217 3 1
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	20 0 0	298 4 4	318 4 4
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	231 2 2	271 2 2
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	281 14 6	321 14 6
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	251 2 1	291 2 1
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	225 5 0	265 5 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	40 0 0	320 6 3	360 6 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	165 0 0	30 0 0	195 0 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	311 7 8	311 7 8
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	311 7 1	311 7 1
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	209 3 3	209 3 3
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	279 9 0	279 9 0
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	298 11 8	298 11 8
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	294 6 10	294 6 10
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	341 9 2	341 9 2
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1700 0 0	1700 0 0
1 4 5	57186 14 1	54739 2 11	53712 8 11	61084 12 9	58705 10 11	65534 8 2	73743 4 0	81538 3 8	79484 10 8	72327 10 0	23191 4 5	20290 4 8	17282 7 7	17552 3 10	14161 12 6	21804 2 7	1642369 2 2
9 14 8	68022 7 2	63009 15 9	63463 0 0	66214 0 1	67741 8 1	67247 4 2	63770 13 6	65824 14 0	65747 15 1	67917 7 8	63162 3 3	69538 13 6	54177 3 7	47987 11 0	43935 5 2	35454 2 7	....
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	51592 1 3	43017 3 1	36103 1 10	30936 0 67	36637 0 53	31744 0 1	31432 0 10	31487 0 0	....
... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	*4540 0 0	9706 5 0	14246 5 0

* N. B.—The charges in these Provinces for years antecedent to 1834-35 are detailed under "Bengal," which Government embraced both the Lower and Western Provinces up to 1833-34 inclusive.

Errors Excepted,

C. MORLEY,

Accountant General.

SUPPLEMENT TO TABLE I.

Supplementary Statement of Sums expended on account of Vaccination in the Presidency of Bengal, from the year 1835-36 *to* 1842-43.

	1836-37.			1837-38.			1838-39.			1839-40.			1840-41.			1841-42.			1842-43.		
BENGAL.																					
At the Presidency,	6554	2	8	10071	10	3	9206	4	10	11502	7	0	6670	13	2	6370	5	0	6282	5	9
Dacca,	2173	9	2	2006	6	0	1999	6	6	1757	6	3	2065	15	10	2042	2	2	763	10	6
Moorshedabad,	2418	3	3	2227	10	8	2036	6	8	2235	6	8	2118	11	1	2054	12	0	908	9	1
Behar,	248	9	8	234	0	0	288	0	0	345	6	8	288	0	0	288	0	0	288	0	0
Bhaugulpore,	417	6	3	304	0	0	324	0	0	328	0	0	373	0	0	369	8	0	429	6	1
Cuttack,	104	0	0	96	0	0	96	0	0	96	0	0	176	0	0	336	0	0	336	0	0
Nagpore,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydrabad,	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Chittagong,	291	0	7	251	10	11	468	1	7	314	13	0	410	15	2	336	0	0	336	0	0
Cooch Behar (or N. E. Rungpore,)	78	8	11	574	1	0	336	0	0	236	0	0	210	10	8	96	6	2	344	0	0
Patna,	2690	15	0	2440	4	0	2440	4	0	2456	4	0	2448	4	0	2072	4	0	818	14	8
Monghyr,	359	11	5	344	2	7	317	14	7	375	11	5	346	13	0	346	13	0	313	15	6
Persia,	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucnow,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Behar Frontier,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arracan,	184	12	5	307	9	9	336	0	0	1296	0	0	1428	0	0	345	4	7	251	5	4
Amherst,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ramgur,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Balasore,	340	5	2	319	12	11	346	13	0	346	13	0	346	13	0	346	13	0	346	13	0
Sandoway,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sylhet,	545	4	1	503	5	0	503	5	0	503	5	0	503	5	0	503	5	0	503	5	0
Backergunge,	263	11	3	328	14	6	312	0	0	305	3	4	335	12	7	325	8	1	331	5	4
Beerbhoom,	374	13	0	341	1	10	316	0	0	335	3	11	313	6	9	336	0	0	336	0	0
Burdwan,	376	15	1	323	5	6	328	8	1	296	10	6	362	13	0	346	13	0	320	0	0
Dinagepore,	338	12	4	375	10	9	346	13	0	346	13	0	346	13	0	346	13	0	346	13	0
Hoogley,	324	14	0	442	13	0	222	3	5	240	0	0	456	0	0	456	0	0	456	0	0
Rajeshahye,	375	11	5	336	10	11	346	12	9	346	12	9	346	12	9	346	12	9	346	12	9
Jessore,	375	6	10	346	13	0	342	13	7	331	7	9	336	0	0	336	0	0	335	11	10
Rungpore,	383	11	5	346	13	0	280	2	5	352	12	4	336	0	0	336	0	0	336	0	0
Mymnnsing,	392	8	4	346	12	0	354	12	0	338	12	0	354	12	0	327	2	11	336	0	0
Tipperah,	369	10	0	323	11	4	336	0	0	336	0	0	336	0	0	336	0	0	316	0	0
Malda,	306	1	6	294	15	0	346	13	0	325	14	1	326	12	7	346	13	0	346	13	0
Shahabad,	320	9	9	324	4	7	325	9	7	308	0	0	320	0	0	336	0	0	336	0	0
Nnddea,	363	11	5	337	2	1	346	13	0	346	13	0	346	13	0	346	13	0	346	13	0
Tirhoot,	447	10	2	425	8	9	438	7	2	332	0	0	477	2	7	432	0	0	412	0	0
Purnea,	359	7	10	311	7	8	336	0	0	336	0	0	336	0	0	240	0	0	240	0	0
Midnapore,	343	3	5	347	11	5	346	13	0	346	13	0	346	13	0	346	13	0	305	0	2
Pnbna,	271	11	5	209	0	2	214	9	4	285	10	0	312	3	9	287	11	7	302	15	10
Lower Assam,	351	12	11	308	0	0	364	0	0	336	0	0	316	0	0	312	10	8	265	10	10
Saurun,	375	11	5	346	13	0	346	13	0	313	6	6	364	0	0	322	0	0	343	8	10
Monlmien,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ramree,	...	...	...	...	...	..	...	...	...	135	0	0	256	10	8	181	15	0	200	0	0
Agent to the Governor General at Hazareebangh under Regulation XIII. of 1833,	65	0	6	96	0	0	88	0	0	80	0	0	218	0	0	120	0	0	96	0	0
24-Pergunnahs,	320	2	1	336	0	0	336	0	0	336	0	0	376	0	0	478	1	1	336	0	0
Maunbhoom,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	13	0
Principal Assistant Agent to the Governor General at Hauzareebaugh under Regulation XIII. of 1833,	...	...	...	...	...	...	...	...	...	...	...	...	32	0	0	3	11	9	...	...	...
Singbhoom,	...	...	...	...	...	...	...	...	...	...	...	...	94	10	8	20	0	0	430	15	6
Cuttack Northern Division,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto Southern Ditto,	112	0	0	104	0	0	88	0	0	104	0	0	96	0	0	96	0	0	96	0	0
Southern Central Assam,	...	...	...	90	15	6	187	1	6	204	0	0	240	0	0	240	0	0	207	1	7
Jorehaut,	...	...	...	...	...	...	...	...	...	30	0	0	...	...	...	...	...	...	210	0	0
Mergui,	...	...	...	38	11	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Furreedpore Deputy Collectorship,	382	0	11	321	5	4	336	0	0	311	3	6	336	0	0	336	0	0	336	0	0
Company's Rupees,	24001	13	7	27085	1	9	25985	9	0	29154	0	8	25706	13	3	23447	3	9	20199	11	7

FORT WILLIAM,
Accountant General's Office,
General Department,
The 14th October, 1844.

Errors Excepted,

C. MORLEY,
Accountant General.

TABLE K.

STATEMENT of Expences incurred on account of Medical Charities in the Lower Provinces of Bengal, from 1838-39 *to* 1842-43.

	1838-39.				1839-40.				1840-41.				1841-42.				1842-43.			
	Insane Hospital.	Native Hospital.	Dispensaries.	Eye Infirmary.	Insane Hospital.	Native Hospital.	Dispensaries.	Eye Infirmary.	Insane Hospital.	Native Hospital.	Dispensaries.	Eye Infirmary.	Insane Hospital.	Native Hospital.	Dispensaries.	Eye Infirmary.	Insane Hospital.	Native Hospital.	Dispensaries.	Eye Infirmary.
BENGAL.																				
At the Presidency,	23573 10 3	.....	13811 6 0	20500 6 11	25778 12 1	6270 0 0	14762 5 9	21728 9 2	29127 5 0	11495 0 0	12860 6 10	20040 2 2	31046 9 7	13585 0 0	14762 5 2	16818 5 7	36792 1 0	12540 0 0	13811 6 0	16267 10 10
Moorshedabad,	5007 0 11	1678 6 0	.....	.....	6569 10 0	240 0 0	.....	.....	5798 13 7	1725 5 4	1374 0 5	.....	5094 6 2	.....	2052 9 0	.....	5467 12 7	.....	2063 11 0	.....
Dacca,	5871 8 2	1881 0 0	.....	.....	6022 8 6	1881 0 0	.....	.....	6708 3 5	1724 4 0	1384 7 0	.....	6728 1 4	2037 12 0	2820 14 4	.....	7222 8 6	1881 0 0	2322 15 9	.....
Chittagong,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1065 6 9	.....	.....	.....	2526 12 0	.....	.....	.....	2891 12 8	.....
24-Pergunnahs,	11290 3 8	.....	.....	.....	11948 10 1	.....	.....	.....	11534 3 8	.....	.....	.....	11959 15 6	.....	2462 3 5	.....	12019 15 2	.....	2204 0 7	.....
Hooghley,	150 8 0	.....	.....	.....	150 8 0	.....	.....	.....	137 15 4	.....	.....	.....	150 8 0	.....	.....	.....	150 8 0	.....	.....	.....
Burdwan,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ditto Deputy Collectorship formerly Junglemehals,	.....	627 0 0	.....	.....	.....	627 0 0	.....	.....	.....	627 0 0	.....	.....	.....	627 0 0	.....	.....	.....	627 0 0	.....	.....
Agent to the Governor General Hazareebaug under Regulation XIII. of 1833,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Patna,	5697 0 4	1881 0 0	1111 3 9	.....	5419 12 1	1881 0 0	2793 6 0	.....	4830 8 7	1881 0 0	3801 8 3	.....	5499 15 4	1881 0 0	3479 11 0	.....	5913 3 8	156 12 0	3630 12 10	.....
Behar,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuttack, C. D.,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	800 0 0	.....	.....	.....	600 0 0	.....
Ditto, S. D.,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3442 2 8	.....	.....	.....	5037 9 5	.....	.....	.....	4164 1 9	.....
Total Sicca Rupees,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
or																				
Company's Rupees,	51589 15 4	6067 6 0	14922 9 9	20500 6 11	55889 12 9	10899 0 0	17555 11 9	21728 9 2	58137 1 7	17452 9 4	23927 15 11	20040 2 2	60479 7 11	18130 12 0	33942 0 4	16818 5 7	67566 0 11	15854 12 0	31688 12 7	16267 10 10

FORT WILLIAM;
ACCOUNTANT GENERAL'S OFFICE,
GENERAL DEPARTMENT,
The 14*th October,* 1844.

Errors Excepted,

C. MORLEY,
Accountant General.

APPENDIX.

SPECIAL REPORTS

OF

SUPERINTENDING SURGEONS,

ON THE SUBJECT

OF

VACCINATION,

Called for by Medical Board's Circular of 14*th October*, 1841, *and addressed to the Secretary.*

FROM DR. G. LAMB,

Superintending Surgeon, Dacca.

Dated 20*th November*, 1841.

SIR,—With reference to your letter of the 14th ultimo, I have the honor to report, for the information of the Board, as follows :—

The cause of the paucity of cases is chiefly indifference on the part of the natives, and neither disinclination nor distrust of the prophylactic effects of vaccination. Few of them think very deeply on the subject, or are able to distinguish between the Small Pox and Vaccine ; further than the fact that one is distributed gratuitously by the Government, and the other is puffed and sold by parties who occasionally travel over the country. And like ignorant people, every where, they are rather disposed to concur in the seeming estimation of the wares put on them by their distributors, that is, they think what is only to be obtained for money must be more valuable than an article distributed gratis.

I do not wish it to be inferred that Cow Pox would be more valued if a price were exacted for inoculation; neither Small Pox nor Vaccine would be propagated were there not people interested in the work by

the salary given by Government, or by the hope of payment, both endeavouring to persuade the heads of families to have their children inoculated.

I am persuaded that if depots for Small Pox and Vaccine lymph were established, with an offer to inoculate gratuitously all applicants, that not five people would take the trouble to convey their children ten steps from their own doors to have them secured against all the evils of epidemic Small Pox in after life.

The Small Pox infection is unhappily constantly kept up in some quarter or other of the country, by the professional Inoculators. Without their assistance the disease would be of much less frequent occurrence. And if Government were pleased to prohibit the dissemination of Small Pox, and provide a few depots for supplying the Inoculators with Vaccine lymph, I have no doubt in time the latter would be in general use, and the appearance of Small Pox would yearly become rare.

The Vaccine lymph in use at Dacca was procured from Calcutta by me about a year and a half ago, and appears so favorable that it is not thought advisable to replace it by the introduction of fresh lymph from the Europe Stock. Lymph from this stock has been used here, but although the appearance and progress of the vesicle were favourable yet its progress was generally retarded at least two, if not three days. The infection seeming to be dormant in the system altogether for that period. After beginning to shew its activity the various appearances of the pustule followed with sufficient regularity and celerity, but as I have said above, it did not seem to offer any advantage over the lymph in use and was not adopted to the exclusion of the old stock.

At several other Stations, particularly at Sylhet, Ferreedpore, Mymensing, Tipperah and Chittagong, lymph from the English stock has been employed to the exclusion of all other, and in general with satisfactory result, though there has not been time or opportunity yet to test its prophylactic powers. At Sylhet and Chittagong, and wherever the rains are very heavy, the virus is apt to degenerate in the rainy months. The lymph becomes thick and muddy, and sometimes the pustules degenerate into purulent ulcers.

In such cases it becomes necessary to renew the virus by fresh importations from Calcutta or Dacca; independent of the circumstance above noted, it is desirable at intervals to renew the virus. Great distress was occasioned in Dacca in 1838, by the appearance of Small

Pox in an epidemic form, when many persons suffered who had been vaccinated. After the epidemic had ceased the Vaccine virus appeared to have acquired so great an affinity to Small Pox that vaccination became very uncertain, and in children of mixed blood a disease very nearly resembling Small Pox was often produced, while in pure native blood this anomalous appearance was comparatively of rare occurrence. Since the change of virus made in April 1840, this has ceased altogether.

I look upon the difference in numbers shewn in the Returns to be dependent entirely on the exertion of the Medical Officers. If the Surgeon pays great attention to vaccination and endeavours to persuade people around him to bring their children, he will have many patients—if he is cool and indifferent, the surrounding population will be equally so.

I am not aware if the allowance for Vaccination is general in this circle, but if it is, a reference to returns for the current year will satisfy the Board that no injustice will be done to the Surgeons at Noakally, and possibly at Gowhatty and Gowalparah, by withholding the allowance till they evince a disposition to make an effort to render value in return to the community. Observing Mr. Baker's return blank for several months I requested Mr. Taylor to send him a supply of Vaccine lymph, and shortly afterwards I was informed by Mr. Baker that he could not overcome the indifference of the natives towards vaccination, and that all his efforts to maintain the infection had proved fruitless.

I have, &c.

(Signed) G. LAMB,

Superintending Surgeon.

From A. HALLIDAY, Esqr.,

Superintending Surgeon, Benares.

Dated 6th November, 1841.

Sir,—I have now the honor to forward to you to be laid before the Board a report concerning the state of Vaccination in this Division.

2d. The annexed Table of persons vaccinated and *said to be vaccinated* in the various Stations shows indubitably that the quantity of work done is not at all equivalent to the expence incurred.

3d. When I was at Ghazeepore last year, Dr. Macnab expressed to me some doubts regarding the reports of his Native Vaccinator who

at that time said he had on his list 13 or 14 successful cases, I ordered them all to be brought to me next morning for inspection, but he could not produce them, so I concluded they never existed, and that he was as *honest* as his brother Native Vaccinators.

4th. This conclusion, if well founded, reduces the work actually done to a very small amount, for except the patients have been seen by the European Medical Officer, no credence whatever can be given to the report of Native Vaccinators.

5th. This small quantity of work done is partly attributable to the indolence and inactivity of the European Medical Officers, and of course much more so to that of those under them. In the City of Benares and its immediate vicinity, the influence of the Brahmins is paramount, and they discourage vaccination with all their power. In the villages however, their influence is not so great, and the lower classes, notwithstanding their apathy, could, with a little coaxing, be brought to submit their children to it—their principal objection to it being that it is done without *poojah* or any kind of tumasha whatever.

6th. From the above Table it also appears that during the hot months in these provinces the disease cannot be kept up, and therefore to keep up the Vaccine Establishment during the whole months of the year is not only a waste of money, but is further hiring men (by nature indolent enough) to acquire habits of idleness which will not likely give way when duty calls on them for activity and energy. Dr. Butter assures me that there will be no difficulty whatever in getting a sufficient supply of well qualified Native Vaccinators for six months in the year, at the liberal salary of eight Rupees a month, and during six months of the year they are at present employed in *merely nominal occupations.* See Appendics A., B., C., and D., from Drs. Thompson, Dunbar, Macnab and Stokes. Dr. Butter informed me verbally that the only use he got of his Native Vaccinators in the hot months was when cholera accidentally broke out, he employed them in distributing medicines throughout the different Thannas and Villages in his district.

7th. Mr. Gordon has up till this date taken no notice of my Circular of the 10th October last.

8th. The Natives have a strong liking for money, and will grudge no pains in begging and stealing it whenever they can. They will not work with their hands to keep themselves from starving, yet they will walk fifty miles to get four annas at a *sharadh.* Now—cannot this propensity be laid hold of, and the six months salary of the Vaccine Estab-

lishment, expended now for nothing, be paid to the children who come and shew themselves to the Superintendent and Deputy Superintendents of Vaccination, when they are successfully vaccinated, at the rate of one anna a coss according to the distance of their homes from the Superintendent or Deputy Superintendents' houses. This will give them some tamasah and some gain, and be as much relished by them as begging or stealing.

9th. There is a Writer attached to the Vaccine Establishment on a salary of fifteen Rupees a month. The same person is employed at the Native Hospital on a salary of sixteen Rupees a month. When or by whom this arrangement was made I cannot tell, but it has existed six or eight years. He resides mostly at Dr. Butter's house, but is not regular in his attendance there, and in the working season he cannot do the duties of the Secrole Dispensary and the Native Hospital, both of these Institutions are at least three miles distant from each other. I would therefore suggest that there should be one Writer constantly employed throughout the year at the Native Hospital, and another employed for the vaccination during the six months only in which the disease can be kept up. That during that period he shall be in daily attendance at Dr. Butter's house, and keep a regular Register of all the patients vaccinated by Dr. Butter and his Native Assistants, stating their residence, parentage, names, caste, ages, date of vaccination, by whom vaccinated, &c. &c. That similar Registers be kept by all the Deputy Superintendents. That all the successful cases throughout the villages be sent by the Native Vaccinators into the offices of the Superintendent and his Deputies to be inspected by them personally, tested by Bryce's Test, paid their travelling money and the Register to have all noted in it, and certified at the end of each day by the signature of the European Medical Officer at the head of the office. These measures will make false returns nearly impracticable, and give something to do for their money to Native Vaccinators, to the Superintendent, and his Deputies.

10th. Would not the activity of the whole department be promoted by paying so much a head for successful cases to each member of the Institution instead of monthly salaries?

11th. With regard to the next point mentioned in your letter, namely, the success of vaccinating with the virus lately imported from Europe, I have to report that I myself brought up some of the virus in glass and in the form of crusts, when only three removes from the European

subject, from Ghazeepore. It failed entirely; Dr. Butter informs me, that the supply of it he got from Calcutta also failed,* and he was forced to send for some of the old kind to establish the disease, from which I conclude it has proved nearly a complete failure.

I have, &c.,

(Signed) A. HALLIDAY,

Superintending Surgeon.

From W. FINDON, Esq.,

Superintending Surgeon, Barrackpore,

Dated 20th November, 1841.

Sir,—Agreeable to the instructions contained in your letter of the 4th September, respecting the state of vaccination in this circle, I beg to say that from my own observation and the information I have been able to obtain, I fear little benefit is to be expected until the inhabitants become more enlightened.

Causes exist which bid defiance to the exertions of the few employed in the dissemination of vaccinations. First, the very great prejudices of the natives from the highest to the lowest to adopt any thing contrary to, or deviating from the established custom of their ancestors; those who submit to be vaccinated are of the lowest cast, and are often paid to bring their children in for the purpose. The higher and more intelligent when questioned on the subject, and having its advantages pointed out, whilst confessing the mortality from inoculation to be full two per cent. cannot be prevailed on to have their children vaccinated. Second, the Inoculators which are numerous (for it is supposed two-thirds of the inhabitants are inoculated) are principally Brahmins of high cast, who envelope in mystery the process, bringing in religion to their aid, Seitlah must be propitiated, poojahs performed, offerings made, during which time those intended to be inoculated undergo some preparation, the Inoculator is feasted and in the end well feed. These men have been asked regarding the policy of receiving vaccine lymph instead of variola matter; they profess to have no objection, but add, the inhabitants would not be

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* Note.—Of course it did, if supplied in June;—but the supplies furnished in autumn and winter following were all from the new Stock; the *old* one having been *carefully* extinguished.—D. S.

satisfied unless pustules appeared throughout the body, and some who are apprehensive of losing a profitable employment, if vaccination became general, are impious enough to insinuate (and thereby to intimidate) that to obtain the lymph a cow is killed; such who believe (and all know the powers of the Brahmin on the minds of the people) would never consent to their children being vaccinated.

It has been proposed, with the view to give more eclat to the operation, that the Native Vaccinator should be invested with a Government Badge, that small tracts drawn up, in the most simple language, divested of all technicality, should be sent to the heads of villages pointing out the great utility of vaccination. With the view to establish vaccination on a firmer basis, and prove its utility, I would propose that Itinerary Vaccinators be made, who, with native assistants, should be able to sweep a whole district—this in general might be effected during the cold season. The principal to move in the centre with the assistants spread out right and left, the principal visiting the village to ascertain how the assistants have performed their work and the effect. The Cossimbazar Island offers a locality under all circumstances the most eligible for a trial of the above scheme should such ever be contemplated.

I have, &c.

(Signed) W. FINDON,
Superintending Surgeon.

From J. MARSHALL, Esq.
Superintending Surgeon, Dinapore.

Dated 29th March, 1842.

Sir,—In obedience to the instructions contained in your Letter No. 753, dated 15th March 1842, I have the honor to forward the Annual Reports and Returns for 1840-41 of persons vaccinated by the Establishment at Patna.

It appears that during the two years under consideration 13,377 persons have been vaccinated, and the number stated to have been successful amounts to 10,854, or eighty-one and a half per cent., a result which affords evidence that vaccination has been adopted with efficacy, and exhibits a comparative estimate of the value of the Patna institution.

The success which has hitherto attended vaccination at Patna and its immediate vicinity must be attributed to the laudable solicitude of the Superintendent to spread the remedy as far as possible amongst the Inhabitants.

The past compared with the preceding year exhibits a diminution of successful cases to the number of 350, and the decrease appears to have suddenly occurred in November and December.

It affords me pleasure to state that the subjects which have been brought by the Vaccinators for my inspection have hitherto exhibited the regular vaccine vesicle, and of late its pure character has been in a great many cases remarkably developed.

The Annual Numerical Return of Persons vaccinated in 1841 by the Deputy Superintendents and Subordiate Establishments at the Stations in this Division (exclusive of Patna) amounts to 5,294; and 3,492 are reported to have been successful, which is in the ratio of 66 per cent.

As far as my personal observations have enabled me to form an opinion of the attempts and efforts made by the Superintendents and the Native Vaccinators, I have every reason to believe that many obstacles to the spread of vaccination in their localities existed ; arising more from the apathy or dislike of the inhabitants to the introduction of the disease than to any want of zeal or diligence on the part of the Establishments.

Circulars by the Magistrates, and pamphlets on the disease have been at different periods distributed in their respective Districts, but it is the general opinion of the Superintendents that, with the assistance of a Peon from the Magistrate's office, the Vaccinators would be able to propagate the disease much more extensively than they can at present.

One Native Vaccinator only is employed with each Deputy Superintendent, and his time is chiefly occupied in finding out subjects for vaccination in the Town and its precincts, and his operations cannot extend into the interior ; and even in this limited locality the interference of the Native Inoculators has materially obstructed his operations, although they are confined entirely to the lowest class of the population, for the higher classes adhere pertinaciously to their old customs and to their Brahmin Inoculators.

As it is a matter of much importance with both classes of Natives, Musselmans and Hindoos, that one of their own cast should be employed about them, the necessity of having one Vaccinator of each cast is manifest.

The means now in operation are made to the advancement of vaccination, but I am fully impressed with the belief that if a greater number of Vaccinators of both castes were employed and their efforts were protected by Magisterial aid, that ultimately the fullest expectations of Government would be realised.

It appears to me that the present system has not worked well because the Establishment is much too small in each zillah ; there ought in my opinion to be a Vaccinator at each Thanna in a District, and some Police rules might safely be enacted in favor of vaccination and specific orders issued by Government to the Magisterial authority regarding the assitance they are expected to give in spreading vaccination.

The prejudices which are said to exist in the native mind against any employment of Police authority are, in my opinion, greatly overrated.

In many instances the plan of sending Vaccinators into the District, without the countenance of the Police, has been found to do more harm than good, and in elucidation of this point I have the honor to transmit three letters from the Civil Surgeon at Purnea and from Dr. Dunbar at Dorundah.

I have, &c.

(Signed) J. MARSHALL,
Superintending Surgeon, Dinapore.

From JAMES ATKINSON, Esq.,
Superintending Surgeon, Cawnpore Division.

Dated 25th September, 1841.

Sir,—I have the honor to acknowledge the receipt of your Circular of the 4th instant, requesting to be furnished with a report on the state of Vaccination in this Division.

2. Accompanying is a table exhibiting the Returns from the different Stations, from which the Medical Board will observe how little has been done during the past eight months. I look upon the unsuccessful and doubtful cases as nothing, and do not implicitly depend on those reported as successful under the hands of the Native Vaccinators, amounting in number to 476. The number vaccinated successfully by the Superintendents is only 68, making a total of 544. Of these Mynpoorie has the largest number, Futtyghur the next, and the next, Allahabad.

At Banda are 14 eases unsueeessful and doubtful, and not one suecessful. The Superintendents at Cawnpore, Etawah and Humeerpore have not, aecording to the Returns reeeived, vaccinated a single individual during the period of eight months.

3. The official explanation of Mr. McCurdy, Civil Surgeon at Cawnpore, is as follows: "I beg to inform you I have vaceinated several children, both Europeans and Natives, during the month of January and February, but by some omission they were not inserted in the Returns. Sinee my return in April I have vaeeinated several Europeans and Natives—in future I shall see that those whom I vaeeinate will be inserted in the Report."

4. The next is Mr. Rose's explanation from Etawah. Mr. Rose has charge of the 11th Regiment N. I. and is Offieiating Civil Surgeon. "Sinee my reeeiving eharge on the 15th Mareh last, no ehildren have been brought to me. On referenee to the letter book, I find it stated by Mr. Palsgrave that he eould not sueeeed in getting the natives to bring in their ehildren, and there is no Vaeeinator attaehed to this Station, who eould by going into the Villages endeavour to propagate the virus. I shall again use my utmost endeavour to extend it, and have to request that you will direet me to be supplied with some fresh virus, that last supplied failed, when tried on an Offieer's child."

5. Mr. Sill, the Civil Surgeon of Humeerpore, says the Native Vaeeinator, formerly attaehed to this Station, was diseharged during the period Mr. Bond was acting as Civil Surgeon in 1840. Sinee whieh period vaeeination has been earried on by the Native Doetor and myself, but no register has been kept.

6. Mr. McCurdy's explanation and Mr. Sill's admission that no register was kept of the number vaeeinated either by himself or the Native Doetor, are not satisfaetory.

7. From my own personal inquiries and observation, however, the very limited extent to whieh vaeeination is now earried is owing in a great degree to the disinelination of the natives to avail themselves of its prophylaetie qualities, and eonsequently, the paueity of eases in the table under eonsideration, bears no proportion to the expenee ineurred by the Government at the Civil Stations. So many instanees of failure oecurring, say 2 in 3, their eonfidenee is shaken or destroyed, for they eannot eomprehend or appreeiate the value of the ehance whieh even that proportion affords, of eseape from the small pox, but disregard the whole, beeause the result is not always absolutely certain, sueh

appears to be the general feeling on the subject of vaccination among the natives in this quarter.

8. Respecting the lymph imported by Dr. Stewart I have the pleasure to add, on the authority of Mr. McRae, in charge of the Cawnpore Dispensary, a most zealous and indefatigable Medical Officer, that "at this place it has succeeded perfectly, and appears to be more energetic than that which was formerly in use. The vesicles are genuine in their characteristics, regular in their progress, and there are few failures amongst the European children vaccinated with it."

9. It is I think clear enough that the Vaccination Establishment in this Division is not repaid by corresponding results, nor is it likely to be, so long as the natives retain their present repugnance to the process. It has been suggested to me that the employment of a high cast Brahmin, accompanied by a Chuprassie, to go into the villages, would have the effect of increasing the number vaccinated, but any thing like authority or compulsion in such matters appears to me very objectionable. It is of vast importance however that the virus should be kept up in as perfect a state as possible, and how that can be done efficiently by any other arrangement, or modification of the present system, is a point which will doubtless occupy the consideration of the Medical Board.

I have, &c.

(Signed) JAMES ATKINSON,
Superintending Surgeon, Cawnpore Division.

FROM G. KING, ESQ.
Superintending Surgeon, Agra Division.

Dated 2d October, 1841.

SIR,—I have the honor to acknowledge the receipt of your letter of the 4th instant, requiring from me a report on the state of vaccination in this Circle of Superintendence.

2. In order that the Board may be able to estimate the limited extent to which vaccination has been carried in this Division, I have deemed it advisable to annex an abstract of vaccination for the past years of 1838-39 and 40; from this statement it will be seen, that the number of persons vaccinated are comparatively few, and quite inadequate to the expence incurred on that account. But in seeking a solution of the cause of failure and the consequent disappointment of the

intentions of Government, in wishing to disseminate the benefits of vaccination among the native population of India, I have found myself at a loss to discover such a reason, as would satisfactorily account for the little success which has attended the means employed for diffusing this great boon throughout these Provinces.

3. It is true, the natives themselves oppose many obstacles to the progress and success of vaccination, as a prophylactic against the Small Pox; some of them are prejudiced from religious motives, others, from caste, are natural enemies to innovation of every kind, but as far as I have been able to ascertain, there are no real objections to vaccination, as connected with the Shasters of the Hindoos, in which are to be found the doctrines of Inoculation.

4. Others again are deterred through pure ignorance, and the fear, that vaccination engenders the real Small Pox ; while a vast portion of the mass of the people are without any knowledge of this great blessing to the human race, or if they should perchance have heard of it, they generally think it of a contagious nature, and therefore have dread of its effects being communicated to the whole of their family. These appear to be the principal causes of disinclination amongst the natives to avail themslves of vaccination, as a preventive against the disease of Small Pox.

5. But notwithstanding the existence of these and other obstacles, retarding the progress and success of vaccination in this country, I am inclined to think that formidable as they are, they may be overcome; and I am satisfied, both from my own knowledge and enquiries, that the better and more intelligent classes of the natives, both Hindoos and Mussulmans, *are decidedly favorable to the practice*—and I am also aware, that in those districts in India, where the value of this great discovery is best known, the inhabitants of all classes, are anxious to avail themselves of the security it affords against a formidable disease.

6. The Officers in charge of Vaccine Depots, and those immediately entrusted with the dissemination of the disease in this circle, do not appear to have been wanting in their endeavours to spread the blessing, as far as the means in their power would allow—but I have my doubts if the System at present in operation for carrying out the enlightened views of Government with respect to vaccination, is in an equal degree fitted for the attainment of the grand object which it was intended to secure. The proof of the inefficacy of the present system, as applied to the Upper Provinces, is its want of success.

7. The Native Vaccinators employed under Superintendents, are generally men, whose reports of cases are not to be depended upon, either as to the number of persons affirmed to have been vaccinated, or the success which attends the operation. I would therefore suggest, if I may be permitted to do so, the employment of intelligent European Vaccinators—or the Native Sub-Assistant Surgeons from the Calcutta Medical College, one in each Circle of Superintendence, whose duty it would be to visit all the principal villages in the circle, once at least, in the season. To make known and explain to the inhabitants the efficacy of the new disease, as a safeguard against the Small Pox, as well as the safety and nature of the substitute itself; and if this duty was diligently discharged, I should expect much success, compared with the present system.

8. Each Division Vaccinator would require an establishment, such as those now obtaining in the Vaccine Depots; and if a Chief Superintendent was appointed in each circle to be made responsible for the performances of the whole establishment, the success in my opinion would be less problematical than on the present system, and would not entail upon the Government much additional expence.

9. In this way, the great boon of vaccination would in a measure be brought to the very doors of the poorest natives, numbers of whom now, (from inability to spare time to undertake a journey and the uncertainty of meeting with prompt attention) are precluded from sharing in the benefit offered them. Their ignorance of its great advantages would, it might be hoped, be dispelled, and thousands of lives saved from the ravages of this scourge of mankind,

10. With respect to the 3d para. of the Board's letter regarding the comparative efficacy of the lymph imported by Dr. Stewart, and that which was formerly in use, I have to state, that from the enquiries I have made on the subject, there can be little or no doubt of its superiority when the disease has been established, but it occasionally fails, as it has done on a very recent occasion.

I have, &c.

(Signed) G. KING,

Superintending Surgeon, Agra Division.

From J. MELLIS, Esq. M. D.,
Superintending Surgeon, Neemuch.

Dated 29th September, 1841.

Sir,—In reply to your letter of the 4th instant, requesting a report on the state of vaccination in this Circle for the information of Government I have the honor to submit the following remarks.

1. As to the stations where the number of persons vaccinated appear to be inadequate to the expence incurred on that account, I have to observe that there are but two altogether in my Circle of Superintendance where persons are paid, viz. this at Neemuch, under Assistant Surgeon Duncan, where the monthly charges are 10 Rupees for a Vaccinator, and 10 for 2 Brahmin Hurkaras; and that of Ajmere, under Assistant Surgeon Russel, where one Brahmin Vaccinator only is employed on a salary of 8 Rupees a month.

2. You will have seen by the Monthly Returns which have been sent to your Board, that the number of persons vaccinated at this Station in 1840 was 411, of which 167 proved successful (to Doctors Duncan and Anderson's knowledge) and that in 1841 to the end of September, of 269 vaccinated, 152 were successful.

3. The Returns from Ajmere for 1840 show that there were vaccinated 170, of which 113 were successful, and that during the present year to the end of August, there have been 321 successful out of 324 vaccinated. I beg here however to remark that much of this success has been owing to the employment of the Europe lymph, and that the difference too in the number of successful cases at Ajmere, compared with that of this Station, is a good deal owing to the former being a large and very populous city and the persons vaccinated being more within reach of the Vaccinators.

4. I do not consider the paucity of cases proceeds from remissness on the part of the Vaccine Officers of these two Stations, but I am warranted in saying that the general failure in propagating vaccination in other parts of the District arises more from the continued disinclination of the natives to avail themselves of vaccination as a prophylactic; one reason for this is that there is less barbarism and ignorance, and more civilization and intelligence in larger Towns and Villages where Europeans and the higher classes of natives mix amongst the population than in those Districts which are thinly populated and whose villages are few and far between. It should be taken into account too that the

greater portions of the Neemar, Malwa, Marwa and Maywar countries are in a very wild hilly and jungly state, intersected by many rivers, ravines and nullahs, with few roads that will admit of easy carriage or uninterrupted communication between different places. To these obstacles may be added the danger arising to travellers from wild beasts and the often more ravenous and bloodthirsty attacks of human monsters.

5. The Medical Officers of the Bheel Corps in this Division describe the rude and half savage state of the people composing them to be such as to incapacitate them from forming any idea of our means of relieving or curing them, or why we should be so anxious to urge on them what they dont value and dont want.

6. An instance occurred the other day where Doctor Anderson, at present in charge of the Meywar Bheel Corps, ordered his Native Doctor (a Brahmin) to give one of the Seapoys a dose of castor oil in the evening, and on going sometime after he was astonished to find his patient covered with blood. On enquiry he found that instead of taking the medicine as directed the oil had been rubbed over the man's head and the blood of a goat, then slain, poured over it. These wild people will not go to hospital if thay can help it, and are often dangerously ill before the circumstance of their sickness is made known. Doctor Anderson says they are at all times suspicious and easily alarmed, they abhor our medicine and many refuse it altogether, which I cannot help, as it seems, they *must not be compelled* to their *good*. They drink large quantities of Dhye as their only medicine, and perform all manner of absurd tricks to propitiate their deities. They use opium generally and in large quantities and drink copiously of a muddy strong spirit prepared from the Mowo—such habits tend much to swell the sick list as this month's Reports state the number in the hospital and lines at Khairwara to be above 200. The barbarous notions and bad habits thus described by Doctor Anderson, I regret to say I have found more or less prevalent wherever I have travelled through these Provinces. The Seapoys even, and some of the more intelligent natives are so given to *superstition*, *idolatry* and *fatalism*, that our best endeavours to benefit them are often marred and defeated. Their blind reliance on fate can only be equalled by their firm faith and dependance on the protective power of Seetla Matta, the goddess of Small Pox. Their want of confidence in vaccination as a prophylactic has been much shaken by the frequent failures that take place compared with inoculation with variolous matter, for it is well known that

the latter is preferred by many even amongst our Troops. A disbelief in the efficacy of both means was very prevalent in Nusseerabad and its visinity some years ago when Small Pox was raging, and many persons were attacked who had been inoculated and vaccinated; successfully as their marks showed. Mr. Surgeon Dalrymple, of the 9th Light Cavalry, wrote me in 1839, that he was sorry to say there had been too much cause for the natives distrusting the benefit held out by vaccination, for he adds the number of cases of Small Pox amongst the European Officers at Nusseerabad during the last two years, had been probably as great in proportion of their numbers as amongst the natives. He ascertained by the examination of 40 patients in hospital, who may be considered as a fair sample of the whole, that not more than half the number were *protected* either by inoculation or having had Small Pox.

8. Equally with the above causes in defeating our best endeavours to do good is that apathy of character which engenders indifference about, if not open resistance against our proffered aid; and even where we have succeeded in getting them to submit to the first process, our object is very frequently defeated by their neglect of the parts vaccinated, losing the crusts when formed, and pleading their avocation for never bringing forward their children to be seen a second time. In short, the main cause of failure, generally, arises from the unwillingness or dislike the natives have to being troubled "or put out their way." Having given the numbers vaccinated by persons paid for doing so, I have now to state that 263 subjects were operated on at different stations, out of which 95 were successful and 26 doubtful. At Joudpore, however, it would seem that the practice has been very successful this year, if the report of the Native Doctor, Shaikh Unnoo, can be relied on. There is no doubt he has had the advantage of being aided by the Police, and by having had regular supplies of Europe lymph. The natives too in and about so large a capital as Joudpore, are more civilized and intelligent.

Still I cannot help receiving the Reports *cum grano salis*. As there is however such an opening for the extension of vaccination I would strongly recommend a Vaccinator and two Hurkaras of the highest caste being established at that Residency under the Superintendance of Assistant Surgeon Russel. At Joypore too a similar establishment might be instituted with considerable advantage. Doctor Russel could do much more than has been done if two Hurkaras were appointed to assistant him and the Vaccinator.

You will see by the annexed copies of my Circulars from time to time, that I have not neglected urging the Medical Officers in my Division to do their utmost in propagating vaccination, and I have no doubt that if the supply of the Europe lymph be well kept up that much more will be done than has hitherto been the case.

Great care should be taken in sending the lymph in its freshest state, as no doubt many of the failures in this Circle have been owing to the very dry heat and state of atmosphere at the time.

I have,

(Signed) J. MELLIS,

Supg. Surgeon, Neemuch.

From W. PANTON, Esq.,

Superintending Surgeon of the Sirhind Division.

Report for 1841.

Sir,—Of the four Vaccine Establishments in this Division, that at Subathoo is by far the most efficient and the most useful, it is conducted by Assistant Surgeon Dr. Steel, who bestows great attention and labour on this branch of his appointment.

During ten months (for in September and October he cannot keep up the practice,) 3,400 persons have been successfully vaccinated.

At Umballa the attempts of the Native Vaccinator to establish the disease were so unsuccessful in the early part of the year, that I requested Assistant Surgeon Jameson to obtain a supply of virus from Subathoo, and test its efficacy before entrusting it to the Native Vaccinator,—this was done, but Mr. Jameson was soon after detached from Umballa and the duties devolved on the Vaccinator. On my visit, the 9th of November, he had no cases to produce, but on Mr. Lovell, 3d Cavalry, being entrusted with the charge, the vaccine was satisfactorily established ; the number reported to have been vaccinated is 180. If the Medical Officer were to reside permanently at Umballa it might be expedient to continue the Vaccine Establishment.

At Hissar and Hansee 154 cases are reported successfully vaccinated, but after careful enquiries made by me, whilst at these Stations, I fully concur in the opinion entertained by the Medical Officers that it is no

longer advisable to continue the Vaccine Establishment, and I recommend accordingly that the Native Vaccinators may be forthwith discharged.

(Signed) Wm. PANTON,
Superintending Surgeon, Sirhind Division.

Kurnaul, 29th May, 1842.

From W. HOUGH, Esq., M. D.,
Superintending Surgeon, Saugor Division.

Dated 5th October, 1841.

Sir,—In reply to your Circular No. 299, of the 14th ultimo, I have the honor to report—

1st. That there does not appear to be any Station within this Circle of Medical Superintendance, in which the number of persons vaccinated has been adequate to the expense ; that, I cannot with any truth affirm, that the paucity of the cases has in any instance proceeded from the remissness of the Vaccine Officers, but, I can state what appears to me to be the actual feeling of the Medical Officers, and what has always appeared to me to be the fact, on my own personal enquiries on the spot, that the natives continue to be disinclined to avail themselves of the vaccine remedy and prophylactic. I do not make this statement on the authority of the Vaccine Returns of the native portion of the operators, but on the strength of the various reports hereunto appended of the European Medical Officers, who have themselves confirmed the statement of the great apathy of the natives to receive the boon of vaccination.

In reply to the concluding query of your letter, I beg leave to state that the vaccine lymph imported from Europe by Dr. Stewart, was tried at Jubulpore, Saugor, and Hussingabad, and that the failure was so conspicuous as to render it impossible to supply lymph to any of the outposts, with the exception of the post of Seonee.

The Reports which I received from the outposts have entirely agreed with those now supplied by the Medical Officers of the Corps and Civil Station of Saugor, and the Civil Station of Jubulpore.

I have, &c.

(Signed) W. HOUGH,
Superintending Surgeon, Saugor Division.

From GEORGE PLAYFAIR, Esq., M. D.,
Superintending Surgeon, Meerutt Division.

Dated 27th September, 1841.

Sir,—I have the honor to acknowledge the receipt of your favor of the 4th instant, and in reply to the 3d paragraph, I am sorry to be obliged to state that the Europe lymph, forwarded by Dr. Stewart, proved perfectly inert, in every instance, although it was extensively tried.

I beg to state, that I shall reply to the other paragraph of your letter so soon as I can do so from personal enquiry and observation.

I have, &c.

(Signed) GEORGE PLAYFAIR,
Superintending Surgeon, Meerut.

From T. TWEEDIE, Esq.,
Offg. Superintending Surgeon, Presidency.

Dated 10th November, 1843.

Sir,—As directed by the Medical Board in your letter dated 14th September, I called on Dr. Stewart, the Superintendent of Vaccination at this Presidency, to furnish me with the information required, and his Report is so satisfactory that I do myself the honor of forwarding it.

2d. It appears from this Report that vaccination has gradually encreased from 920 in the year 1835 to 6546 in the year 1840, and as he is quite satisfied by actual inspection that the whole of these cases may be depended on, there is no doubt but that at the Presidency, the number of persons vaccinated is adequate to the expence incurred.

3d. Further, it appears that there is a certainty of keeping up vaccination at the Presidency throughout the year, which is proved not to be the case at most of the stations throughout Bengal and the North Western Provinces, where it constantly fails during the hot months, and a fresh supply of virus is in consequence regularly furnished by Dr. Stewart.

4th. Dr. Stewart remarks a point of great importance, viz. that throughout Hindoostan the virus is either lost altogether or degenerates in its powers during the hot months, and again resumes its original appearance in the cold season, from which I am led to think that it is only when in full force so as to affect the system with a febrile irritation

that it can *be depended on* as a prophylactic, and as native children are inferior in energy to European children, the disease is of a less satisfactory character and the system is often unaffected—hence one principal cause of the want of confidence in vaccination among the natives.

5th. It is well known that the natives of India are averse to innovation, as they are quite satisfied with the variolous inoculation which has been in use from time immemorial, they do not see that a preference should be placed on a new European mode, which they have found most uncertain, and their general doctrine of predestination prevents them from seeing the evil of propagating an infectious disease.

6th. Variolous Inoculation, as performed by the Brahmins, produces a much milder disease than in Europe; a moderate degree of fever, with very slight and often no eruption, I believe to be the usual result, and this is said to be effected by inserting the virus by a number of scarifications over a large surface, and using matter which is rendered less virulent by keeping.

7th. For the above reasons vaccination is in little repute in Hindoostan, and as the number vaccinated bears no proportion to the native population, the expence incurred is quite inadequate to the benefit conferred, with the exception of Calcutta and a few Stations, where the climate is so temperate as to allow of the disease fully developing itself and affecting the constitution.

8th. It is said that vaccination has been much more successfully propagated at Madras, this is no doubt the case from the more temperate climate and the greater assimilation of the inhabitants to European manners; but I place no more confidence in Native Returns there than I do in Bengal, where the number successfully vaccinated is much overrated.

9th. The vaccine lymph, lately procured from Europe by Dr. Stewart, has been extensively disseminated, and possesses fully the genuine character of the disease ; but I have no doubt that it will in time degenerate, and that an occasional supply from a cold climate will be required to keep up the original vigour of the Jennerian vaccine.

I have, &c.

(Signed) T. TWEEDIE,

Officiating Superintending Surgeon, Presidency.

G. H. Huttmann, Bengal Military Orphan Press.